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Conservative Management of Fractures

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In this paper, an attempt will be made to emphasize the importance of conservative treatment in the management of selected cases of fracture.

Before discussing management of specific fractures, it might be well to review the fundamentals of good nursing, which is necessary so that errors do not occur in the preliminary care that will complicate the clinical picture. For example, emphasis should be placed upon all factors that make the patient comfortable, such as proper rest, splinting of injured parts, the arrangement of the patient's bed, convenient location of the signal button, availability of his bed table, turning the patient in the correct manner, the use of the bed pan, and even the administration of medications. It is well to consider the advantages offered by an overhead frame for the use of the patient in exercising and manipulating his body for various aspects of nursing care.

AMBULATION AND EXERCISE

Ambulation and exercise are factors of paramount importance in the treatment of patients with fracture. When suitably carried out, these factors can be responsible for shortening the hospital stay and certainly the period of convalescence. For example, I frequently encourage patients to exercise immediately following surgery and even preface this program with a training program of exercises prior to surgery. This is particularly advantageous in surgery for joint injuries, and it is remarkable in preventing atrophy and obtaining a fuller range of motion following surgery.

The patient who has suffered a simple Pott's fracture can be encouraged to exercise the trunk, the opposite leg, the upper extremities, et cetera. In so doing, he will shorten his convalescent period and increase his general body activity to such a degree that he will suffer less deterioration to the body as a whole.

A problem which is frequently overlooked is preparing the patient for surgery and anesthesia. I think we must pay as much attention to the psychologic aspects of these two procedures as to the medical approach. I cannot stress this too much. For instance, the patient should be aware of the type of anesthesia he will be given, and the type of procedure that will be performed should be explained to him. Thus disappointment following surgery may be avoided. The patient should be introduced to the anesthetist and relieved of the mental anxiety which so frequently characterizes surgical patients.

The postoperative care program should be given much consideration, although I find that it is often overlooked by many surgeons. Postoperative care is particularly important in the convalescence of the patient who has undergone radical surgical procedures, but is also important in conservative management. In most instances, the proper use of chairs, walkers, crutches, and exercises and prevention of deformities are the major considerations and are handled quite well by both patient and physician under a program of conservative orthopedic care.

TRACTION AND SUSPENSION

Traction and suspension are used in the treatment of orthopedic problems such as fractures, dislocations, and traumatized joints and tissues. They are also used to initiate active and passive motion during the convalescent period. The physician as well as his assistants should be thoroughly familiar with the principles and application of traction and suspension in order to avoid complications which are sure to develop when they are improperly used. The patient should be kept under constant observation, and adjustments to the apparatus should be made only by individuals familiar with its physics and mechanics.

Suspension consists of supporting the extremity or the part of the body from a frame with slings by means of cords, pulleys, and weights. We are all acquainted with this type of apparatus, but it might be well to mention the importance of having the sling made of a strong, firm cloth such as a heavy canvas, which will not wrinkle or tear easily. It might be made of several narrow strips, but they should be wide enough to avoid producing pressure sores or impeded circulation.

The upright portion of the frame and bars may be made secure to the bed by a special apparatus made for the specific purpose or simply by constructing the frames of 2-by-4's which will suffice in emergencies. The principle involved is merely that of providing an overhead frame for the attachment of pulleys and other apparatus, as mentioned above, and any mechanic or carpenter can do it with little supervision.

Traction may be applied by the technic commonly known as skin traction, whether anklet or wristlet, by moleskin tape or other adhesive reinforced by muslin or roller bandage. It is possible to use some preparation such as tincture of benzoin on the skin to aid the adhesive effect of tape and help to protect the skin from the pull.

For children up to 5 or 6 years, I find that traction applied to both lower extremities with the legs suspended overhead and just enough pull to keep the buttocks free of the bed will give the best results in treating femoral fractures (Figs. 1 and 2). There are special countertraction units that can be made to immobilize the pelvis, but their use is seldom necessary.

Skeletal traction, utilizing the Thomas splint with the Pearson leg piece, is a very successful way of applying traction in treating fractures of the tibia and severe injuries around the knee joint. This is familiar to all doctors treating fractures and dislocations.

Skeletal traction may also be applied by inserting a wire or pin through the bone. Many doctors hesitate to use this method because of the mistaken belief that it produces extreme pain to the patient both during the procedure and during the time of traction. Actually it does not, and it is simple to insert a Steinmann pin through the tibia or femur or a screw into the ulna for skeletal traction, using 1 or 2 per cent Novocain or Cyclaine for local anesthesia.

The procedure is to create a bleb with the anesthetic, insert the needle through the soft tissues into the periosteum on each side of the involved extremity, and anesthetize the periosteum. A slight stab wound is made for insertion of the drill into the cortex, or the Steinmann pin alone can be used to complete the pene-

Fig. 1

tration. This procedure can be carried out with very little discomfort to the patient, and I feel that it should be used more often. It is imperative, however, that it be carried out under the most sterile conditions; it should be considered the same as an open reduction procedure. Any deviation from sterile technic may result in contamination which will produce a greater problem than the original one. Precautionary measures must also be taken to keep the wound well covered to avoid contact contamination.

Another useful apparatus, the Roger Anderson well-leg splint (Fig. 3), provides a good means of traction for the patient who is a poor surgical risk. This, too, can be applied very satisfactorily under local anesthesia.

BRACES AND SPLINTS

There is a great variety of braces and splints or mechanical devices used to assist in immobilizing injured parts. Although braces and splints are lighter and more durable than plaster of paris casts and easier to apply and remove, they are somewhat hazardous in that the patient can remove them or alter their application. Further, they are made for the average patient, and no one is average. Plaster of paris casts, on the contrary, are made specifically for the individual. However, the necessity of braces and splints is recognized, and they are used by all physicians doing orthopedic and traumatic practice.

Some of the more specific braces are quite useful, for example, the ankle brace. Following a severe sprain or Pott's fracture, especially where there needs to be support and limit of inversion or dorsal flexion and plantar flexion, use of the ankle brace is most helpful. Other braces with a spring attachment might be utilized. The spring is attached to the heel and the sole of the shoe to spring the foot into dorsal flexion in treating foot drop. These braces or splints, of course, can be modified by springs and locks to give the desired support or effect, and they are of inestimable value in the treatment of ankle injuries.

The long leg brace is useful in treating injuries to the knee with involvement of the collateral ligaments, or in cases where there is marked paralysis of the leg or thigh. The long brace makes it possible for the patient to walk without the buckling effect of the unstable knee joint. It is a simple matter to have a locking joint at the knee of such an apparatus, which can be freed to allow flexion of the knee joint during sitting.

The prolongation of the full leg cast up to the groin, giving support on the ischium, is frequently referred to as a walking caliper. This is a useful support for the patient with a repaired fractured femur that has not healed adequately to support weight. The key to the successful use of this brace is that it must actually be an ischial weight-bearing mechanism.

The basic braces and splints for the spine are usually employed in the treatment of tuberculosis, spinal fractures, hypermobile lumbosacral joints, during postoperative convalescent periods, and occasionally for spinal arthritis. Spinal braces vary in their use, depending upon their desirability as seen by the physician and upon the need for a position of flexion or extension. For example, in compression fractures the brace most frequently used is an extension type, better known as a Taylor brace, whereas in lumbosacral sprain the type more commonly applied is the Bennett brace, which is used in a more or less neutral position to alleviate some of the lordotic stresses and strains so frequently present.

In the cervical region, the cervical brace gives immobilization by providing a chin and shoulder rest,

Fig. 2

Fig. 3

which reduces the movement of the cervical vertebrae and may provide some traction or extension, depending upon the position of the osseous structures.

CASTS

When using plaster of paris casts it is paramount to have all bony prominences well padded. Direct contact with the skin is to be avoided as infection can result from contaminated plaster; tetanus is known to have resulted from this source of contamination.

The procedure of protecting the skin from plaster of paris at our clinic is to use stockinette, fitting it as snugly as possible, and then applying the felt padding over the prominent bony areas. All of this is then incorporated in plaster. It is a mistake to apply stockinette or other forms of padding over the felt pads and then apply the plaster, because in order to avoid slipping and displacement it is necessary for the plaster to adhere to the firm felt padding. Sometimes it is most helpful to remove a circular spot from the cast where it covers the abdomen, thus allowing a small doorway for ventilation and skin cleansing. If the cast is of firm construction and well proportioned, enough room can be allowed in the axillary region for the patient to move his arms freely without weakening the cast.

The technic of immobilizing the lower extremities by plaster of paris casting usually entails the application of a body cast and elongating or extending it completely over one extremity and half of the other. This cast is called a spica and a half. There are occasions when it is necessary to have a double spica, which includes extension of the cast over both extremities, including the ankle joints. The plaster jacket is another method of immobilizing the spine, and it has many variations. Mention might be made of the antigravity cast, which is used by many of our osteopathic orthopedists in the conservative management of the disk problem, particularly of the lumbosacral region. This is a cast which extends from the inferior gluteal folds up to the lower dorsal region, with the patient in a position of marked flexion. Although discussion of this technic could be elaborated to fill the remainder of this paper on general conservative orthopedic principles, suffice it to say that immobilization of the body in a state of marked flexion seems to be the most logical approach to conservative management of disk lesions in the lumbosacral area.

The Risser jacket is used for the correction of scoliosis; it extends from the chin and occiput to the pelvis and down at least one thigh. Hinges are incorporated anteriorly and posteriorly in the cast and a turnbuckle is inserted in the concave side, so that the entire jacket can be bent laterally to correct the deformity.

Casts for the upper extremity are usually applied with the idea of incorporating the joints above and below the fracture. I try to follow this very closely. In fact, even on Colles' fractures I incorporate the metacarpal joints and the elbow joint for the first 2 weeks, running the cast up to the axillary area.

In treating fractures involving the proximal one third of the humerus with displacement of the tuberosity, I usually incorporate the forearm, arm, and body in a plaster cast with the patient's arm in a position of abduction and marked internal rotation (Fig. 4).

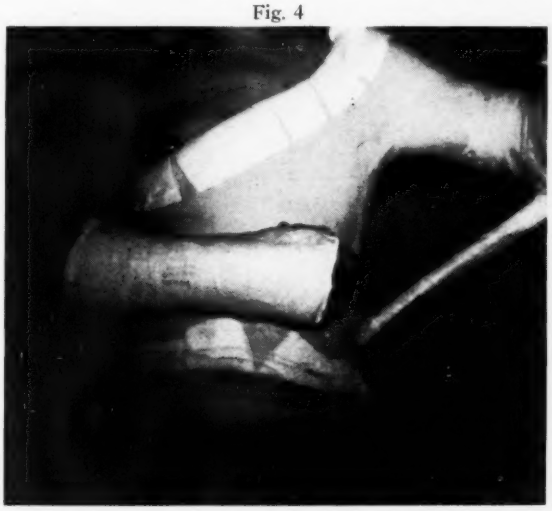
Some mention should be made of the technic of removing casts. It is well to recall the position of the sheet wadding or thin strips of felt, as they can be used for a guide line or marker when removing the cast, and when the vibrating saw or other cast-removing instruments are used, the skin will be well protected. This brings to mind an incident related by a patient who came to me from a distant city for the treatment of a simple fracture. I asked the patient why she had traveled such a distance. She answered that in her home town a child with a similar fracture had had his cast trimmed while under general anesthesia and during the process the little finger was removed. Of course this was a needless tragedy which was made worse by the fact that the child had shown an aptitude for music and had had several years of training. His parents felt that he had been destined to be a fine pianist. A great deal of care must be given to the trimming and removal of casts safely and adequately.

ROENTGEN RAYS

Radiography is important to the orthopedic surgeon from a diagnostic point of view and should not be devalued in the least. I feel that two views of any involved part is an absolute minimum. In most instances, right and left oblique exposures should also be done. Preoperative and postoperative x-rays should be ordered routinely in every orthopedic department.

Accompanying the radiographic examination should be a complete physical examination, including palpation of the adjacent joints. In severe trauma, a traumatic series should be run. More than once I have thus discovered fractures of the femoral neck when patients

Fig. 4



apparently had only a simple Pott's fracture.

Another comment on x-ray concerns their therapeutic use. Undoubtedly roentgen therapy is helpful in the treatment of various tumors. In benign giant cell tumor and in some malignant tumors such as Ewing's tumor, reticulum cell sarcoma, multiple myeloma, and metastatic tumors, roentgen therapy may relieve pain as well as help to control the growth itself.

Roentgen therapy may also relieve pain in various fibromuscular diseases, such as fibrositis, myositis, tenosynovitis, synovitis, and bursitis. It is believed to be of some value in the softening of keloid tissue and in controlling Dupuytren's contracture of the palmar fascia.

PHYSICAL MEDICINE

In concluding discussion of the basic principles of conservative orthopedic care, I would like to emphasize the importance of osteopathic manipulative therapy in aftercare. This important principle used in conjunction with physiotherapy in its many other forms can relieve the patient of local discomfort and increase or hasten healing of diseased areas and improve the function of healed areas. I sincerely believe that of all the specialties modern physical medicine has the brightest future. I feel that orthopedic surgery combined with physical medicine has a distinct advantage over most of the other specialties.

In physical medicine much of osteopathic philosophy has been usurped and utilized. It is routine in the clinic and hospitals of the Kansas City College of Osteopathy and Surgery to treat patients, both the conservatively and radically managed, with osteopathic manipulative care preoperatively and postoperatively.

An excellent example of this regimen is found in the handling of disk problems. I have never felt that there is any great contraindication to manipulative therapy in disk lesions. We are cognizant of the fact that frank rupture of an intervertebral disk will not respond to manipulative therapy, and perhaps the symptoms may be exaggerated somewhat. However, I do not believe that manipulative therapy actually causes damage to the involved nerve roots or other soft tissues, and in many instances it alleviates much of the pain and discomfort.

There are other classical entities used in physiotherapy that could be mentioned at this time. Soothing and relaxing heat increases the local circulation and is ideal as a preliminary to exercise. Heat may be applied to extremities in the form of moist packs or hot water soaks to which may be added Epsom salts, boric acid crystals, or table salt (approximately 1 teaspoonful to a pint of water). I use warm water in whirlpool baths, where the water is agitated by an inflow of air. Contrast baths, using alternate hot and then cold water, are used also to increase or stimulate the circulation. It should be kept in mind that following any form of heat, the extremity should be elevated for 20 to 30 minutes in order to avoid swelling of soft tissues. Heat may also be applied with the infrared lamp and, in some instances, with the ultraviolet lamp, which has some cutaneous heat value but is used primarily for the ultraviolet ray effect.

Diathermy or microtherm radiation is often used; I feel that it increases the local circulation and promotes healing as well as relieves pain. This therapy can be overdone, however, and may cause excessive vascularization and promote some bone decalcification with prolonged use. Occasionally pain follows the application of diathermy, especially if it is used over a tendon that is calcified. Administering diathermy over a portion of the body in which metal material has been placed for internal fixation should definitely be avoided.

Cold is applied after an injury or operation in order to limit the bleeding and control the swelling for the first 24 hours. It may be applied by cold cloths, ice packs, and alcohol packs. In discussing the use of cold, mention might be made of ethyl chloride spray, as it is utilized for trigger-point freezing with gratifying results.

FRACTURES OF THE HUMERUS AND FEMUR

After reviewing various fractures seen in my practice, I have elected to discuss the technic, from a practical point of view, of handling fractures of the humerus and of the femur. These two bones were selected because of their importance in good body mechanics and because of their frequent involvement in trauma to the body.

Fractures of the Humerus.—

First I will discuss fractures of the humerus. Until recently, nonunion has been encountered by most orthopedists more frequently in the humerus than in any other bone. This, I believe, has been due to difficulty in establishing rigid immobilization by either internal or external fixation. Therefore, with this thought in mind, my approach has been to utilize in all possible instances the conservative method of treatment in fractures of the humerus. This consists of manipulating the fragments into a reduced position and then splinting the extremity to the thoracic cage, either with a Velpeau bandage or an abduction humerus splint. This method of immobilization is most adequate as a rule and is usually carried out for 2 to 3 weeks, after which a hanging arm cast is applied. This provides traction, with the points of traction being through the sling and the arm. Angulation can be controlled either by shortening or lengthening the sling or placing its attachment either to the dorsal or volar side of the cast. This method has been used in patients with fractures of the neck, shaft, and the head of the humerus. Of course, a supracondylar fracture will not respond to this approach.

Of these I would like to discuss fractures of the neck of the humerus. It is probably most convenient to classify fractures of the neck of the humerus into three categories, namely, abduction, adduction, and transverse. The abduction fracture seems to be the most common in adults, and if the patient is over 55 or 60 years of age, the extent of treatment can be limited to the hanging cast. There would be no concern over breaking up a moderate degree of impaction, however, and if the patient is younger the impaction should be reduced and the extremity immobilized in a position of adduction for a 2-week period before applying a hanging cast.

If the greater tubercle has been broken off and displaced, it is probable that an open reduction or manipulative procedure will be required to replace the fragments. Immobilization for a 2-week period should be followed with a hanging cast. If the greater tubercle is not replaced and is allowed to heal in a malposition, the patient will suffer marked restriction in abduction.

The second type is the adduction fracture. The reduction of this fracture is effected by traction and abduction, which can be carried out by the application of an abduction splint at about a 60 degree angle from the trunk following reduction. Occasionally, in this type

of fracture, the interposition of the biceps tendon is a complication, especially if the fracture is associated with an epiphyseal dislocation. If the closed method of reduction is unsuccessful, open reduction is sometimes necessary with internal fixation of the parts by ligature or a screw.

A third group, the fractures of the shaft of the humerus, are usually oblique, comminuted, or spiral, and occasionally transverse; they usually heal rapidly with the utilization of the hanging cast. It is well to mention a few principles concerning the mechanics of application of this method. The elbow must be in a flexed position of approximately 90 degrees with the cast extending from midpalm to slightly, not in excess of 1 or 2 inches, above the fracture line. It must be light to avoid distraction, and a circular ring for the attachment of the sling should be placed at the level of the wrist. It is advisable to have two loops, one dorsal to correct for lateral angulation and one volar to correct for medial angulation. The sling can be lengthened to correct for posterior angulation and shortened to correct for anterior angulation. The patient should be urged to exercise the extremity eight to ten times daily, using a circular hanging motion and concomitantly exercising the fingers and thumb. If complications require the patient to be recumbent, some form of apparatus should be applied in order to maintain proper traction constantly.

Fractures of the Head of the Humerus.—

These fractures as a rule are either comminuted or so-called split-head, with or without dislocation from the glenoid. They usually require open reduction, with an attempt to mold the fragments into position and immediate casting followed by a 3-day interval x-ray studies. If good results are not obtained, a more extensive open reduction is done, with repair of the parts with chromic or silk suture or by removal of the fragments and application of a prosthesis.

Conclusion of Conservative Management.—

Fractures of the neck of the humerus or impacted fractures are best treated by closed reduction, immobilization for a 2-week period with a Velpeau bandage, followed by the application of a hanging arm cast for a period of 2 to 4 weeks, and the use of intensified early exercise. Abduction fractures without marked avulsion of the greater tubercle may be treated similarly.

Adduction fractures should be reduced and immobilized in a position of abduction by the use of an abduction splint for 2 to 3 weeks, followed by the application of a hanging arm cast. Fractures through the shaft of the humerus can be treated by this method, but require much closer attention and more frequent post-traumatic x-rays to control the points of traction and the positioning of the sling. The use of basic exercises and the fact that the humerus has a good blood supply are believed to be the major factors in determining the success of this treatment.

Fractures of the Femur.—

Fractures of the femur may involve the neck of the femoral condyles or the shaft. They may be oblique, spiral, transverse, or comminuted. In this injury overriding or angulation is common because of the strong muscle pull. Reduction may be maintained by a traction-suspension apparatus, either through the utilization of skin traction or skeletal traction, or by the insertion of two or more wires through the fragments and incorporating the extremity in a plaster of paris cast. In patients up to the age of 5 or 6 years, Bryant's overhead suspension is a satisfactory method.

Occasionally, the transverse fracture may be manipulated into position with the fragments well engaged and be immobilized in the plaster spica from nipples to toes. The disadvantage of this method is that it predisposes the patient to stiffness in the knee joint and generalized atrophy of the extremity involved.

It is my opinion that fractures of the cervical portion of the femur and some cases of supertrochanteric fractures are best managed by the use of Knowles pins. It is possible to obtain internal fixation with these pins with a minimal amount of surgical trauma and time. The technic is carried out under sterile conditions as in any open reduction, with a small stab wound made on the lateral aspect of the femur and with the aid of the fluoroscope. The pins are tapped gently and turned rapidly, which makes them self-tapping. After the cortex is penetrated, the pins are threaded across the fracture site, so that the heads fit snugly against the periosteum. Usually two or three pins are used and little difficulty is encountered in getting them through the center portion of the neck of the femur. The operative site requires no suture and only a small dressing. This I believe could be considered conservative management.

Conclusions.—

It is my opinion that the most conservative method of the management of fractures of the neck of the femur is the use of the Knowles pins, because this enables the patient to be up in a sitting position and in a wheel chair and even into a walker or on crutches within a very short time following the injury. This avoids complications such as bedsores, renal or bladder calculi, and infections, as well as the other complications that result from abrupt inactivity of the aged. Fractures involving the femur of the patient up to the age of 5 or 6 years is most satisfactorily managed by Bryant's traction.

Patients who are poor surgical risks and who have marked displacement are probably handled most satisfactorily with the use of the Roger Anderson well-leg splint. Extensive surgical exposure for the application of plates and bars and direct and absolute exposure of the cervical portion of the femur in the trochanteric areas should be avoided because of their effect on the vascular supply, which is one of the major factors in nonunion. More conservative practices, such as outlined above, produce a more satisfactory result.

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BACKACHE

In any discussion of the subject of backache, the first consideration should be the structure of the spine itself. A study of comparative anatomy shows that the number of vertebrae in the lumbar region varies considerably from the many lumbar vertebrae in certain orders to the few in others, and that these differences occur at the thoracolumbar or the lumbosacral levels. Variations in the shape of the bones, as well as in the number of the vertebrae in the lumbar region, should be expected in the human spine. These anatomical peculiarities are only part of the problem. In considering the elements which make them a special source of difficulty, probably the most common is imperfect use of the body, so that the weight-bearing points in the lower back become abnormal.—Joel E. Goldthwait, M.D., in The Back and Its Disk Syndromes, by Philip Lewin, M.D.

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Whiplash Injuries

Management and Complications

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INTRODUCTION

Whiplash injuries are among the most frequently occurring conditions, and until recently very little had been written about them. It is conceivable that with more cars on the road each year and with increasing speed, the number of cases will become greater, even with all the plans for revised car seats and seat straps. Unless the head and neck are also strapped, a false sense of security will be thrust upon the public.

I chose this subject for two reasons, first, to stimulate discussion and to increase my own knowledge on the subject, and second, to point out the potential seriousness of this type of injury.

First of all, it is necessary to understand the meaning of the term, which is really quite simple and descriptive. It is most easily described as a hyperflexion of the cervical spine followed by a spontaneous extensor recoil. Although the great majority of these injuries result from auto collisions, they may also be caused by sudden stopping of a car, diving accidents, or by the throwing of the head and neck when a person slips while walking. It is readily understood that in a moving car the body is traveling at the same speed as the vehicle, and when the car suddenly stops, the trunk of the body and legs are usually braced, and the cervical spine is snapped forward and then recoils. This explains why the thrust of the forces is accentuated in the cervical area.

Necessarily the degree of whiplash is dependent upon the degree of impact or rate of speed at the time of impact, and the area of the cervical spine involved is modified by the force of impact. The entire cervical spine can be involved, or the impact can be confined to a specific area if the person becomes aware of the impending impact and guards against it by bracing the shoulders and neck. Nevertheless, impact in this instance is not wholly avoided and usually one specific segment of the cervical or cervicodorsal spine absorbs the shock.

Immediate complications include compression fractures of the vertebral bodies, pedicle and spinous process fractures, dislocations or subluxations, immediate disk rupture, varying degrees of ligamentous sprain and/or tear, capsular tear, and varying degrees of traumatic cartilaginous impact, which to me represents the insidious onset of traumatic arthritis. It can readily be seen that the gamut of cervical disorders can result from the forces set in motion by such an injury.

It is unfortunate that the term "sprain" is used so loosely in reference to the cervical spine. When the condition in the ankle joint is referred to, at least some degree of ligamentous and/or capsular tear is usually denoted, depending on the severity of the injury, and, as a general rule, an adequate program of treatment is laid out. Yet in cases of trauma to the cervical spine it it amazing that so light an attitude can be maintained, as when the patient is blithely told he has apparently nothing more than a "sprained" neck. It is at this point that the physician, particularly the orthopedist, should be especially cautious and thorough in his examination. It is my opinion that all cervical spine injuries, regardless of the significance attached by the patient, should be x-rayed. Unlike more superficial injuries, outward signs of hemorrhage, deformity, pin-point tenderness, and the like may be totally lacking. Probably everyone has seen at least one case in which apparently complete dislocation of a cervical segment occurred with disastrous effects to the patient, but on x-ray it was found that the spontaneous recoil mechanism had completely reduced the dislocation. Therefore, x-ray findings cannot be depended on solely. Evaluation must be made of all presenting symptoms, clinical findings, and adjunctive laboratory findings that are applicable to the case.

I shall not attempt to detail the complications that occur with whiplash injuries, but shall confine myself to so-called sprains or luxations of the cervical spine, disk lesions, and the traumatic arthritic syndrome.

SPRAINS OR LUXATIONS OF THE CERVICAL SPINE

Fractures and dislocations of the cervical spinal segments should be fairly easily diagnosed with adequate x-rays and with competent interpretations of the x-ray studies. Treatment of these complications is adequately outlined in all books dealing with orthopedics, and no attempt will be made to discuss them here.

As I stated earlier, a whiplash injury is the hyperflexion of the cervical spine followed by the recoil mechanism provided by the posterior articular ligaments and ligamentum flavum. Nearly all of the damage is done by the hyperflexion. What then are the criteria for diagnosis? It will be assumed that an adequate history has been obtained, and this cannot be stressed too strongly since a rather large percentage of these cases are somewhat quiescent for varying periods of time, and if all details of the history are available, much trouble may be avoided later, especially if a lawsuit is involved.

Careful, extensive, and adequate examination is carried out, and x-rays should be obtained. The patient's word should never be accepted that x-rays were taken and found to be negative. The physician should examine the x-rays himself and also with an experienced radiologist.

A cervical spine that is straightened and splinted and has lost its normal anatomic curve should never be dismissed as normal. Even though fractures and dislocations have been ruled out, a straight cervical spine indicates that some mechanical derangement has taken place. This one feature may be the only clue to the so-called lesser injuries which can in time cause the patient much grief and disability. Naturally, a great number of these cases will in a few days or weeks resolve themselves with no complications, but the cases that do not resolve themselves form the basis for this paper.

It is well to remember that disabling symptoms can arise months or even years after the original injury. This can possibly be attributed to neglected cases in which ligamentous stretching has taken place and, with continued use of the part, the ligamentous structures have healed in a lengthened and weakened position. This, in itself, without other immediate complications,

results in a disabling symptom to the patient. It would be interesting to know the number of cases of scalenus anticus syndrome that result from this type of injury. Why is it not possible that the fibers of the scalene muscles tear, owing to the automatic recoil mechanism, and formation of scar tissue with fibrosis and, subsequently, the scalenus anticus syndrome result?

A majority of these cases will not be seen by the orthopedist immediately after the injury, but will have been treated by the family doctor or general practitioner for various lengths of time. This serves usually to delay adequate treatment.

I shall first discuss the case which is referred to the specialist immediately following injury. After an adequate history and x-rays are obtained, a method of treatment must be selected. If the x-ray findings are negative, treatment will necessarily depend upon the severity of the symptoms.

Treatment may consist of osteopathic manipulative therapy or of protective immobilization, but selection of cases for either method must be done very carefully.

In the absence of positive x-ray findings and after a careful analysis of the case, osteopathic manipulative treatment of the area may be the method of choice. There are, I believe, two objectives of osteopathic manipulative treatment of this condition. One is the correction of articular lesions, and subsequent improvement of circulation in the area; the other is relief of the muscular spasm and resultant irritation. The extent of ligamentous stretching and fiber tearing is difficult to assess, and cautious judgment is essential if osteopathic manipulation is to be employed. From experience I have learned that without proper evaluation of the case the patient is definitely not benefited by such a course of treatment. It is far better, in my opinion, to plan the method of management carefully and with full consideration of the problem and the patient, than to attempt a miraculous recovery with overeager treatment. The longer I am associated with orthopedic problems, the greater is my respect for conservative consideration of each patient as an individual case with the objective of restoring function. Therefore, except in the very mild and slightest traumatic incident, my treatment consists of temporary cervical immobilization.

Because in all methods of management employing adjustable braces and the like, patients are apt to tamper with or alter the fixation apparatus, I prefer the cervical cast or plaster collar. It is extremely important in the application of this collar to make the distance from chin to chest as great as possible, in other words, to hyperextend the cervical spine. Since the greatest damage of whiplash injuries is due to hyperflexion, relaxation and apposition of those ligamentous structures placed on stretch is obviously obtained by immobilization in hyperextension. The collar does not have to be uncomfortable or heavy, and there is no reason the patient cannot be ambulatory from the time of application of plaster. The period of immobilization may vary from only 3 to 6 weeks. Perhaps this method of treatment is ultraconservative, but to me it is the only means of avoiding luxation of the cervical spine or any portion of it.

CERVICAL DISK SYNDROME

Certainly the predominant complication which eludes early x-ray diagnosis is the cervical disk syndrome. If the greatest damage occurs in hyperflexion of the cervical spine, it appears logical that capsular and posterior articular ligamentous tears occur and also tears and/or irreversible stretching of the posterior annulus. The cervical intervertebral fibrocartilages, like those in the lumbar area, are thicker in front than behind, and, in addition, in proportion to the length of the cervical spine, they constitute a greater percentage of that length. However, the lumbar spine has heavy protective muscular and ligamentous elements. The less protective elements combined with the greater mobility of the cervical spine leave no doubt that here is a perfect area for disk damage to occur, and whiplash injury is a frequent cause of this damage.

The symptomatology of cervical disk protrusion is familiar to all, and there is no need to discuss it now. However, neurosurgeons are becoming more and more inclined not to operate in every cervical disk disorder, but rather to use conservative treatment except in the exceptional case of instantaneous traumatic rupture. Management by means of a plaster collar described for early luxations of the cervical spine also provides better protection for the patient with cervical disk protrusion. I certainly do not intend to give the impression that all cases of cervical disk syndrome can be prevented by this means, but I do believe that erring on the side of conservatism to the benefit of the patient is not an error of judgment. Surgical treatment of cervical disk disorders is not within the realm of this paper since my objective is only to attempt to show the close causative relationship of whiplash injury of the cervical spine to the production of the cervical disk syndrome.

TRAUMATIC ARTHRITIS

The final problem which I shall discuss is traumatic arthritis. It is interesting to note that in the articles I have surveyed on this subject I could not find any reference to involvement of the cervical spine; discussions were restricted to larger joints, usually weight-bearing joints. Perhaps this is justified on the basis of predominance, but certainly it is not justified on the basis of disability to the patient.

Traumatic arthritis is a low-grade inflammatory process which develops in a joint subsequent to injury, and it is characterized by limitation of motion, pain, and disability. In contrast to the usual arthritic process, traumatic arthritis is usually made worse by exercise and is relieved, at least in part, by rest. It also differs in that the disability usually tends to progress instead of to decrease as time passes.

The underlying basis is contusion of the joint cartilage, whether of a weight-bearing joint or an articular joint of the cervical spine. This leads to degeneration of the cartilage with subsequent development of arthritic changes. There is of course great variation in the time required for these changes to produce symptoms.

It is said that this condition is more prone to occur in those past middle age who are of the heavy, plethoric type.[1] The age incidence is not surprising because cartilaginous degeneration may be expected to be more predominant in those of later life, except, of course, that of Perthes' disease which has a different pathologic basis and is self-limiting.

There generally follows, after a variable length of time, thickening of the articular facet with destruction of the cartilaginous surfaces. Subsequently there is overgrowth of bony elements, or hypertrophic changes, with increasing pain and disability to the patient and resulting decreased mobility of the part. These symptoms may present themselves some months or even years after the original injury and become increasingly severe and disabling. Various degrees of radiculitis may accompany the neck symptoms, or they may be

restricted to the cervical area alone, depending upon the area or segment of involvement.

As a general rule, the patient with traumatic arthritis in the cervical spine is resistant to rapid recovery. Occasionally slow recovery may be due to the possibility of a financial settlement resulting from a lawsuit following the injury. Disregarding the possibility of malingering, these cases usually require some months of treatment.

The management regimen is not spectacular. In my limited experience, I have found cervical traction both at home and in the office, together with temporary cervical support and one of the cortisone products, to afford the best relief. X-ray therapy has also been used with reportedly good results. To my knowledge, there is no report of Hydrocortone injection into this area, and it is my opinion that the dangers and mechanical difficulties associated with such a procedure would far outweigh any possible advantages. I repeat that temporary cervical immobilization in hyperextension might well be advantageous. If one believes, as I do, that the original cartilaginous impact, with continued use and irritation of the part, is the basis of traumatic arthritis, then I believe it follows that temporary rest of the part in a position of decreased local pressure may serve to minimize this potential complication.

Although this paper expresses my personal opinion, I hope it will encourage the use of caution in the management of whiplash injuries of the cervical spine, and in so doing result in elimination or diminution of complications.

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DISCUSSION

Troy L. McHenry, D.O., Los Angeles: Dr. Wright has presented certain fundamental concepts relative to whiplash injuries whose general philosophy I find no reason either to challenge or criticize. Therefore I shall discuss his paper from the standpoint of elaboration of many things which he was forced to touch upon but lightly. This discussion will be broken down into subheadings of mechanism, pathology, symptomatology, examination, treatment, and complications and prognosis.

MECHANISM

Whiplash injuries usually occur in three ways: (1) The first involves a passenger in an automobile which strikes a stationary object. The primary force is one of an acute sudden flexion of the cervical spine, followed by an extension rebound or recoil motion. This type of injury probably is more predominant in the rural areas and on the highways in the United States. (2) In the second type a passenger is in a stationary automobile which is struck from the rear by a moving automobile. A reverse series of traumatic forces is produced; acute hyperextension is the basic force, and the recoil or rebound flexion is the secondary force. This type of injury probably is more predominant in heavily populated towns and cities. (3) A composite, and possibly more serious injury, involves a passenger in a stationary automobile, which is struck from the rear by a fast-moving automobile, the first automobile being projected forward by the impacting force into a stationary automobile ahead. Both hyperextension and hyperflexion injuries result, each of equal seriousness. Most of these injuries occur on tightly congested freeways.

PATHOLOGY

Hyperextension produces two injuring forces. The first is traction on the anterior sections of the vertebral bodies, producing damage to them, ranging from simple strain pulls to partial or total ruptures of either the anterior section of the annulus fibrosus or the anterior longitudinal ligament of the spine. The second is forceful, compressive impaction or jamming of the articular mechanism. Acute flexion forces produce compression of the intervertebral disk. Compression forces are directed toward the anterior sections of the bodies of the cervical vertebrae, with potential compression fractures of these structures, and distraction forces affect the posterior neural section, including the posterior section of the annulus fibrosus, the posterior longitudinal ligament, the ligamentum flavum, the interspinous ligaments, the capsular elements, and the restraining ligaments of the articular mechanism, associated with, in severe cases, dislocation. However, those basically under consideration are subluxation of the cervical articulations.

In association with the above, there is a series of secondary soft tissue injuries characterized by rapid stretching or evulsion of the muscular apparatus, intermuscular septa, and fascial planes. In acute flexion injuries, this will primarily be directed toward the posterior cervical soft tissues and, of course, in hyperextension injuries, to the anterior cervical soft tissue structures.

One is frequently impressed with the rather severe complaints of patients who sustain primary hyperextension injuries when the accident was not particularly severe, while on the other hand, patients who have passed through what would appear much more severe flexion forces have many times lesser symptoms. The findings of the Research Crash Council of the United States Air Force[1] are most illuminating. They have demonstrated that the cervical spine can withstand a flexion acceleration of 50 times the force of gravity without major injury, whereas extension acceleration only five times the force of gravity can be tolerated without damage.

SYMPTOMATOLOGY

The history of the patient's symptoms will vary somewhat with the extent and the type of injury, and considerable attention to the sequence and timing of the symptom-complex described by the patient will give much assistance in establishing the extent of the injuries.

In less damaging injuries, wherein the basic disorder is primarily that of a sprain syndrome involving the soft tissue elements and the capsules of the joint, the patient complains very little of acute or dramatic symptoms for the first few hours following the injury. Many times the normal nervous upset consistent with any type of injury, a certain degree of nausea, and some minor soreness and stiffness in the neck are all that are complained of during the first few hours. However, after a period of 12 to 24 hours, as postsprain edema invades the normal mobile elements of the cervical spine and produces lack of flexibility, pressure, and pain, and the associated reflex mechanism, the patient will develop progressive pain and restricted motion of the cervical spine, increasing nausea, pulsating headache of a general type, and many times a headache of suboccipital through occipital distribution, these latter symptoms being the result of abnormal stimulation to the upper cervical sympathetic ganglia and irritation to the radicular elements of the upper cervical spine involving the occipital nerves. With the development of these delayed symptoms, there is produced secondary acute muscle spasm of the paracervical muscles, both back and front, depending upon the forces involved, and thickening and elasticity of the muscles as they become diffused with edema.

Should a patient develop more severe and dramatic symptoms immediately following the injury, there is justification in presuming that damage beyond that of a sprain is probably present and that disk, arthrodial, and ligamentous damage may

be severe. Symptoms of these more serious injuries occur usually at or within an hour of the accident and are characterized by very rapidly developing pain, rigidity, torticollis, true radiculitis, or segmental neuralgia, frequently of the brachial-radicular type and usually associated with a suboccipital or occipital pattern, intense nausea, frequent vomiting, and a pounding headache. In all types, both mild and severe, considerable psychologic upset is usually present.

EXAMINATION

The objective examination may of necessity, depending upon the severity of the patient's symptoms, be substantially restricted in its scope. The taking of the sequence of events of the progress of the symptomatology and the history, palpation of cervical muscles to determine which of the structures are in the most acute spasm and pain, observance of what areas of motion of the cervical spine are most restricted, and outlining of areas of cutaneous perversions of sensory perception and noting whether there is associated motor disturbance of the upper extremities are essential to determine which of the structures are most seriously involved and whether or not the flexion or extension injury is the one of prime importance, inasmuch as the conclusions based upon these findings manifestly influence the method of treatment.

In addition to the objective clinical examination, x-ray studies are imperative. Usually, in the conditions under discussion, x-ray findings will be negative for fracture or dislocation. However, much information can be gleaned from x-ray studies of cervical motion and flow. The most information can be gained from lateral projections, and in the neutral position many times it is noted that the normal cervical lordosis is flattened or reversed because of muscle spasm. Lateral projections should also be obtained with the neck in hyperextension and hyperflexion. These three lateral views then give an indication of whether the cervical movements flow normally or whether certain segments are either fixed or hypermobile, and many times the acute flexion views will show a definite subluxation which is not visible in the neutral position. Not only are these preliminary x-rays necessary from a standpoint of immediate evaluation, but they are valuable for comparison with subsequent x-rays in determining any delayed pathologic changes that might have occurred.

TREATMENT

Treatment will vary, depending upon the pathologic conditions and forces present, and should be instituted only after an adequate analysis of the major type of injuries has been made.

All whiplash injuries of the cervical spine are produced by severe mechanical forces. It would therefore seem obvious that any type of therapy directed to these injuries must not add insult to already existing injury. The traumatized tissues should be placed in a state of physiologic rest, edema combated, and nervousness of the patient allayed. Adequate sedation to relieve pain and reduce irritation is essential. Drugs such as Dramamine also combat nausea and have a certain sedative effect upon the psychologic disturbance of these patients. Definitive therapy of the less severe types of injuries probably will consist of some degree of immobilization. A simple Schantz collar will be satisfactory. Frequent office visits will be necessary for soft tissue massage and rhythmic, gentle, cervical traction to reduce the muscular and associated tissue edema. Early corrective osteopathic manipulative therapy should be used with caution, even following simple injuries. Minimal doses of ACTH may prove effective in combating post-traumatic fibrosis and the development of chronic symptoms. As the days pass and the acute traumatic phase has receded, specific osteopathic manipulative therapy directed toward the cervical spine may be used to normalize the mechanics and mobility of this area. I have found osteopathic manipulation particularly beneficial in alleviating persistent occipital neuralgia and headache with occipital distribution.

Patients with immediate and more dramatic symptoms indicating more serious disorders should have their treatment predicated upon whether or not the basic injury is due to acute flexion or acute extension. These patients should be hospitalized rather than treated as outpatients. In these cases, instead of using an immobilizing collar immediately, jury-mast cervical traction is instituted with about 5 pounds of pull over the end of the bed and with the patient in a modified Fowler position. In addition, rather continuous application of cold to the cervical spine and the neck is utilized to reduce edema, and sedatives, ACTH, Dramamine, and other drugs are prescribed if indicated. After a few to several days, depending upon the severity of the injury, when edema around the neck is receding, immobilization is instituted. If x-rays obtained with the neck in flexion show anterior subluxation of a cervical segment and the other clinical findings indicate an acute flexion lesion is the primary pathologic state, I apply a Thomas molded collar or a cervical brace with the neck in hyperextension, or if the injury is basically an acute hyperextension lesion, the immobilization apparatus is applied with the head in the neutral position.

If rupture of the anterior longitudinal ligament and evulsion of the anterior annulus fibrosus are suspected, the patient is immobilized even though some degree of flexion is present. This is to prevent excessive gaping of the anterior torn ligaments and to distract the somewhat impacted posterior arthrodial articulations. In these more severe injuries, where there has been obvious ligamentous tearing, a minimum of 6 weeks of immobilization is utilized to permit repair of the torn tissues and a certain degree of early contracture to take place. Too early discarding of the immobilizing apparatus will permit the ruptured ligaments to heal in a relaxed state, thus producing hypermobile areas of the cervical spine which may become more or less permanent. Only after removal of the restraining collars and immobilizing apparatus are massage and rehabilitation procedures instituted, and it probably will be necessary to continue their use for weeks or months.

Surgical intervention is utilized only in those cases presenting progressive intractable pain and progressive motor weakness and atrophy. In the convalescent phase, certain trigger areas of residual sensitivity may be found between the spinous processes as a result of the concussion of spinous process against spinous process producing inflammatory tissue or bursa, residual fibrocytic nodular formation, et cetera. Symptomatic relief of these trigger areas is hastened by local injections of Procaine and hydrocortisone.

COMPLICATIONS AND PROGNOSIS

One of the most difficult complications of any injury is post-traumatic neurosis or hysteria; particularly when litigation is pending, recovery tends to be slow. The attending physician, although warning the patient of a slow recovery rate in the more serious types, must, however, exhibit an optimistic attitude. Bizarre symptoms and manifestations are always an indication of a slow psychologic recovery. In the acute flexion lesion, in which the posterior restraining elements such as the longitudinal ligaments, ligamenta flava, and interspinous ligaments have been damaged, the holding of the head erect may be difficult, and the fatigue syndrome may be quite prolonged. Actual ruptures of the intervertebral disk, although rare, may require eventual laminectomy if intractable pain, muscular weakness, and atrophy continue. This particular complication, however, in my experience, is extremely rare. Much more common in the acute flexion lesion is subsequent intervertebral disk degeneration with narrowing of the intervertebral disk space, spur formation, and condensation of the adjacent vertebral plates. This frequently will not show up on x-rays for the first few months, and when it does, the patient can anticipate some annoying neck symptoms, although not necessarily severe, for more than a year. There is also the possibility of some minor permanent disability of the neck. Acute hyperflexion injuries rarely cause major permanent disability or damage to the arthrodial mechanism but acute hyperextension injuries, with the jamming and concussion of the adjacent articular cartilages, may produce delayed post-traumatic arthritis in these structures. This likewise does not show up on roentgenologic examination the first few months. It is a late manifestation which causes some degree of local and neuralgic symptoms which may persist indefinitely. Treatment is difficult, and most of the time the condition is resolved through physiologic processes rather than as a specific response to medical therapy.

CONCLUSIONS

Whiplash injuries of the cervical spine, without gross fracture or fracture-dislocation, require considerable attention to determine the major traumatic forces so that definitive treat-

ment may be instituted. Simpler strains have very few acute early symptoms and usually, unless a neurosis is present, resolve themselves under adequate therapy within a few weeks. Acute symptoms of more serious injuries are relieved within a few weeks, but subacute or chronic symptoms may continue for many months, possibly for more than a year. Delayed complications such as discogenic spondylosis or post-traumatic arthritis of the arthrodial joints may occur several months after the injury, and therefore a final prognosis in these severe injuries is difficult until at least 9 months have passed after the accident. Less severe injuries usually heal without permanent disability, but more severe ones may leave the patient with some minor permanent disability and, in a very rare case, may require surgical intervention.

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Traumatic Meniscal Lesions of the Knee

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Traumatic meniscal lesions are generally included under the heading of internal derangements of the knee, as first described by William Hey[1] in 1784. Other pathologic conditions included under this same broad heading are: (1) sprain or rupture of the lateral ligaments, (2) rupture of the cruciate ligaments, (3) loose joint bodies, (4) fractures of the tibial spine, (5) hypertrophy of the infrapatellar fat pad, and (6) chondromalacia. Injuries to the semilunar cartilages are the most frequent types of internal derangement of the knee joint and, like the sprains of the knee, most of the cases occur in young men who are engaged in strenuous athletics or heavy manual labor. Though some authorities may consider the semilunar cartilage to be a relatively insignificant structure so far as function is concerned, it assumes paramount importance from a pathologic and clinical standpoint.

The knee joint is the largest joint in the body. It is hingelike in character, and its stability is dependent upon the integrity of the ligaments and supporting muscles and tendons. On complete extension of the knee the ligaments provide a rotary locking. At this point, all the ligaments are taut and neither rotation, anteroposterior gliding, nor lateral motion can be elicited. With the knee flexed, a certain degree of the aforementioned motions is possible; these motions should be compared with those of the opposite knee during examination. Brantigan and Voshell[2] note that the articular contact between the tibia and femur is always present; thus the menisci do not cushion a blow from above or from below. Stewart,[3] however, feels that the cartilages do serve as cushions to the peripheral edges of the femur and tibia on abduction and adduction movements.

It has been estimated that traumatic lesions of the medial meniscus occur with eight to ten times the frequency of lateral meniscus injuries.[4] This may be attributed to the more frequent use of the medial pivot mechanism that produces the medial meniscus injury and to its more firm attachment to the capsule and tibial collateral ligament. The majority of the lesions of the internal semilunar cartilage are due to sudden forcible internal rotation of the femur on the slightly flexed and fixed tibia. The most frequent injury is a longitudinal split in the cartilage, or bucket-handle tear, in which the inner portion is torn from the outer margin but remains attached at both ends.

In our small series of 28 consecutive arthrotomies of the knee, performed from 1953 to 1955, 18 cases or 64 per cent, were bucket-handle tears of the medial meniscus. Other medial meniscus lesions included 4 peripheral detachments, 2 anterior horn tears, 2 posterior horn tears, and 1 transverse tear of the middle third. A pedunculated flap represented the only lesion of the lateral cartilage in this series.

DIAGNOSIS

An accurate history is most important, since often the diagnosis is based more upon the history than upon the physical findings. A typical history may be given of an injury sustained to the flexed, weight-bearing knee when it is twisted, as by a pivot. The meniscus, which is fixed between the tibial and femoral condyles, tears as excessive rotation occurs. A greater degree of knee flexion at the instant of injury causes the tear to be situated nearer the posterior end of the cartilage. Acute pain results, followed by swelling caused by either hemarthrosis or excess synovial fluid. The knee may be locked, making it impossible to attain the terminal degrees of flexion and/or extension. Extension may be limited by a tear of the anterior horn, while a posterior horn tear usually results in limitation of flexion. A bucket-handle tear will often result in limitation of motion in both directions.

During the acute stage of the first episode of knee symptoms, it may be difficult to accurately determine the exact pathology, other than an acute synovitis. With a history of previous locking or buckling of the knee, the diagnosis may not be as difficult. In recurrent cases, the symptoms are not as severe, and the locking is often transient in nature. In many instances, the patient may have learned to unlock the semilunar cartilage himself.

If the patient is seen in the interval between attacks, the physical signs upon which a diagnosis is based may be lacking. It must depend almost entirely upon the characteristic history of buckling and locking. There may be tenderness to palpation anteromedially at the joint line or at the medial collateral ligament. Pain may be produced medially by sudden external rotation of the leg while the knee is flexed. There is usually some atrophy of the anterior thigh muscles. The McMurray sign with the presence of an audible and palpable click, clunk, or thud, and the degree of knee extension or flexion at which this occurs, helps confirm the diagnosis and indicates the site of tear in the meniscus.

Meniscus injuries may be associated with other traumatic lesions of the knee such as cruciate or collateral ligament sprains or ruptures. If physical findings indicate their presence, treatment would vary and perhaps be more urgent than in the uncomplicated meniscal tear. Anteroposterior and lateral x-rays of the knee should be made in every case, supplemented by films including a notch study and a tangential view of the patella to eliminate the possibility of fracture, a loose joint body, chondromalacia, or other bony in-

volvements. In the presence of acute lesions, where considerable hemorrhage or joint effusion has taken place, differentiation between true and pseudo-locking may be difficult. Complete extension of the knee may be impossible until the reaction has partially subsided. The limitation of the terminal 5 or 10 degrees of extension may not be noted until a comparison is made with the normal knee.

The routine use of pneumoroentgenograms would not seem to be necessary, but in a specific problem case in which the diagnosis is still quite uncertain, despite a thorough history and physical and x-ray examinations, such a procedure may yield additional important information. Stewart[3] feels that pneumoroentgenography as a means of diagnosis has been of little value. He states that lesions which can be visualized by pneumoroentgenography can be diagnosed clinically, that is, those with a gross or obvious bucket-handle tear. He mentions further that in the remaining cases, he has not been able to arrive at a proper interpretation of the roentgenograms with any measure of accuracy. Murray[5] does not believe that pneumoroentgenograms are of sufficient diagnostic help to justify their routine use. Pneumoroentgenograms were performed in two of our cases, but were felt to contribute little additional information.

Many authorities feel that once the diagnosis of a torn cartilage has been clearly established, the treatment should be surgical excision of the torn cartilage. In our series, we chose to wait and attempt conservative treatment in those presenting symptoms for the first time. No patient was submitted to operation unless it was clear that the symptoms were disabling and recurrent. The duration of symptoms varied considerably, but almost all the patients had recurring episodes of instability and locking of the knee joint. Eighteen cases, or 64 per cent, involved the right knee. The medial cartilage was involved in 27 cases and the lateral cartilage in only 1. The sex distribution was 25 males and 3 females. The oldest patient was 64 years of age and the youngest 15, with the average being 30 years of age. A history of 10 years' duration was the longest and 4 weeks' duration the shortest, with the average duration of symptoms prior to surgery being 7 months.

CONSERVATIVE TREATMENT

Conservative treatment is essentially the same as for acute synovitis. In the presence of marked joint effusion, aspiration should be carried out under rigid aseptic technic. The knee is then snugly supported with an elastic bandage and the patient permitted to ambulate with crutches. A few days later a plaster cylinder cast is applied extending from the groin to the ankle, with the knee in full extension. Weight-bearing is permitted following application of the cast, with specific instructions on quadriceps setting exercises and straight-leg-raising. The cast is removed in 4 to 5 weeks and more intensive quadriceps resistance exercises are prescribed along with hydrotherapy. In the presence of true joint locking initially, the reduction of the displaced fragment of the torn cartilage is attempted. If reduction is impossible, general anesthesia is administered and the reduction then carried out. This is followed by joint aspiration in the presence of marked effusion and the treatment continued as previously outlined.

OPERATIVE TREATMENT

If displacement has occurred more than once, or if the symptoms persist after immobilization, an exploratory arthrotomy is indicated. Operative intervention should not be delayed, for arthritic changes may develop in the joint when the torn cartilage is allowed to remain as an irritant to the synovial membrane and hyaline cartilage.

In our series, prior to surgery the patient was instructed to perform quadriceps setting exercises. The usual 48-hour orthopedic preparation of the skin was not carried out in these cases. Eighteen hours prior to surgery the hair was removed from the groin to the ankle, the skin scrubbed with either pHisoderm or Septisol, followed by sterile water and aqueous Zephiran, and the extremity wrapped in sterile towels. The entire procedure was repeated in the operating room. The operative field was rendered bloodless by applying an Esmarch bandage and an inflated pneumatic tourniquet. Our anesthetic choice was spinal anesthesia. The knee was draped and flexed so that the sterile foot rested on the operator's lap with the operator in the sitting position.

A short 2- or 3-inch anteromedial incision was generally adequate and permitted visualization of the anterior part of both the medial and lateral cartilages, the anterior cruciate ligament, the posterior surface of the patella, and the articular surface of the femoral condyle. An attempt was made to preserve the infrapatellar branch of the saphenous nerve. In a few instances the nerve was severed, with resultant numbness but without subsequent neuroma formation. In every case the entire meniscus was removed. In the majority of patients the cartilage was detached peripherally with a curved cartilage knife and dislocated into the intercondylar notch. The attachment of the posterior horn was then severed through the notch and the cartilage removed.

In eight cases, two incisions were necessary to facilitate a complete removal of the damaged cartilage. The second incision was a posteromedial, or Henderson, incision. After closure of the wound in layers, a firm dressing was applied and an elastic bandage extending from the groin to the toes. The tourniquet was then released.

The knee was immobilized in complete extension for 3 or 4 days postoperatively. Quadriceps contraction exercises were commenced the first postoperative day and continued daily, together with attempts at straight-leg-raising. Ambulation on crutches was permitted on the fourth or fifth postoperative day, and partial weight-bearing on the involved extremity was permitted during the second postoperative week. The average patient was discharged from the hospital on the eighth day after surgery and instructed to perform daily quadriceps resistance exercises. Full weight-bearing was permitted in 2 weeks. The patient was examined at weekly intervals thereafter and was not discharged from our care until he could fully extend the knee against 25 pounds of resistance. The power of full extension of the knee had returned in nearly all cases within 4 to 5 weeks. In 4 cases aspiration had to be performed for excessive joint effusion, probably resulting from premature weight-bearing postoperatively. We have not had complicating joint infection in our experience.

SUMMARY

Traumatic lesions of the menisci are a very frequent cause of knee joint disability. During the first episode of joint symptoms or when the diagnosis is not certain, conservative therapy should be instituted. Excision of the entire involved cartilage is necessary in recurrent cases. Daily quadriceps exercises must be performed conscientiously in order to attain a satisfactory result.

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DISCUSSION

Glen W. Cole, D.O., Norristown, Pa.: My first comment is to compliment Dr. Heleotis for his excellent presentation. My management of these problems differs little from his.

The history of injury relative to position at the time of trauma and location of the pathologic findings is a point well taken. Unfortunately, the patient is not able to recall this detail in every instance. Repeated episodes of locking and in many instances comparative ease of reduction by the patient are rather common in the recurrent conditions.

On examination of the patient who has a recurrent problem it is my experience that hypermobility of the meniscus with tenderness can be elicited with the patient sitting on the side of the examining table. The patient's leg is controlled by the examiner's thighs while the examiner grasps the affected knee with both hands. The thumbs are used to palpate the articular space above the tibial table on each side, while flexion and extension are passively produced with lateral or medial pressure exerted with the hands. Collateral ligament laxity is elicited at the same time. Comparison with the opposite knee is helpful. X-ray examination was well covered by Dr. Heleotis.

The only addition to the conservative program is the use of felt under the elastic bandage. This is cut as a ¾-inch band, expanded to 1¼ inches at the ends, and placed so that the band is posterior, with the expanded ends covering the articular sides and terminating on each side at the patellar margins. Adhesive tape will keep the felt in place while the elastic bandage is applied. Casting or splinting is reserved for the severe, acute ligamentous injury. When it is comfortable, ambulation is permitted with the elastic bandage in place.

Surgical management varies little. I usually employ a transverse, slightly curved incision at the articular level, including the capsule anterior and posterior to the collateral ligament. The incision described by Dr. Heleotis would appear to permit more extensive exploration within the articulation.

I have observed degenerated cartilages more often than bucket-handle deformities.

832 DeKalb St.

Osteoid Osteoma

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DISCUSSION

In 1935 Jaffee[1] described a small, oval, or round nidus-like benign neoplasm of bone, which was referred to as osteoid osteoma. Since that time, more than 250 cases have been described, and the lesion has become well known to orthopedists and radiologists.

The exact etiology of osteoid osteoma is still questioned, although there are two principal theories. Jaffee originally maintained, and has since reaffirmed,[2] the opinion that the process is a true primary benign tumor of bone. Brailsford,[3] MacKenzie,[4] and Hellner,[5] however, believe that the lesions are only a low grade, cortical or subcortical, nonsuppurative inflammatory process in bone. Jaffee's theory is based on the fact that these patients fail to demonstrate any constitutional symptoms or signs which usually accompany an infectious process; cultures which are obtained from the lesion at the time of surgery are sterile, and microscopically it does not have the appearance of an infection. On the contrary, however, the radiographic studies reveal a zone of sclerotic bone surrounding a small area of radiolucency, which might well support the theory that the lesion is due to a nonsuppurative bone infection.

Osteoid osteoma is noted most frequently during the second decade of life, although, according to Sherman and Caldwell,[6] it has been reported in a child of 18 months and in a woman of 54 years. There have not been more than a dozen instances recorded in persons more than 30 years of age. This fact is perhaps the most important evidence that osteoid osteoma probably heals spontaneously.

Osteoid osteoma has a predilection for the male sex, in the proportion of two to one, and has been described in all the bones of the skeleton except those of the skull and the face. Approximately half of all cases have occurred in the tibia or femur.[7]

Attention is usually called to the lesion by intermittent localized pain, which is worse at night, and is frequently present for many months or even years before the patient seeks relief. At the onset, pain is usually mild and inconstant, but gradually increases in severity and persistence until the patient is unable to sleep. Localized swelling may or may not be observed, depending upon the amount of overlying soft parts. If it is superficial, localized palpatory tenderness is frequently elicited. Characteristically, patients fail to demonstrate any systemic manifestation, and there are no laboratory studies which assist in the diagnosis.

The radiographic findings are by far the most important factor in the diagnosis. Although the nidus-like focus is the osteoma per se, there may be a peripheral zone of bone thickening, or sclerosis, extending for a considerable distance beyond the nidus. The nidus may be located in the spongiosa or within the cortex and does not exceed 2 cm. in its greatest dimension. When the lesion arises in cancellous bone, there is a circular lesion of radiolucency, with no perifocal condensation of new bone. If it arises in the cortical bone, however, a minute, rarefied, circular lesion is noted, which is surrounded by a marked reaction of dense new bone, which may extend for one third to one half the length of the shaft. Owing to the density of the sclerotic zone, the central area may be masked, thus making diagnosis rather difficult. When the lesion is superfi-

cially located, the tumor often abuts and even erodes the overlying cortical shell.

Pathologically, in the early inactive phase of this lesion, there is proliferation of vascular skeletal mesenchyme, with an abundance of osteoclasts and osteoblasts. As a result of the pathologic processes, the cancellous or cortical bone undergoes resorption. Because of the activity of the surrounding osteoblasts and fibroblasts, the osteoid spicule, which develops as the lesion progresses, becomes calcified. The outstanding features of the pathologic processes are the usual absence of cartilage formation, the failure of the osteogenic process to form mature osseous structures, and the limited size of the lesion.[8] This pathologic entity is frequently confused with syphilis of bone, sclerosing osteomyelitis, and Brodie's abscess.

Surgical extirpation of the nidus is followed by a lasting cure of symptoms. It is most important that the lesion be well localized prior to surgery by radiographic studies, and by furthur films at the time of surgery to assist in judging the adequacy of the excision and to obviate the necessity for future surgery. Providing that the nidus is completely removed and the area thoroughly curetted, it is not necessary to disturb the adjacent sclerotic bone. Although osteoid osteoma will eventually heal spontaneously, the pain produced by the disease is usually of sufficient magnitude to warrant surgical removal.

CASE REPORTS

The following cases have been selected to illustrate this interesting lesion:

Case 1. A boy, aged 9, had pain and swelling in his right leg for 3 months prior to examination. The onset was sudden and awakened the patient from sound sleep. At first pain was intermittent, being worse at night, and was relieved when the boy walked. Symptoms gradually became more severe and persistent. The history revealed that he had been kicked in the involved area approximately 2 months prior to the onset of symptoms.

Examination revealed swelling and palpatory tenderness over the anteromedial aspect of the leg, approximately 10 cm. distal to the knee. There was no evidence of inflammation. Active and passive motions of the knee were within normal limits and free from pain.

Radiographic studies revealed the presence of a fusiform enlargement of the diaphysial portion of the right tibia. Sclerosis was present with associated thickening and alteration of the endosteal bone. The medullary portion appeared normal. A nidus was present in the center of the involvement. There were no periosteal changes which might indicate activity.

The pain and disability persisted, and the nidus was removed surgically approximately 1 year following the onset; relief was permanent. Histologic examination confirmed the diagnosis of osteoid osteoma.

Case 2. A male, 18 years of age, complained of pain and swelling in the right little finger during the preceding 12 months. The pain became more frequent, and swelling gradually increased. The onset of symptoms occurred approximately 2 weeks following an injury to the hand.

Examination revealed a fusiform swelling of the proximal phalanx of the right little finger. The mass was firm and tender on palpation. Motion of the proximal interphalangeal articulation was restricted and painful. Mild inflammatory changes were noted at the site of the lesion.

Radiographic studies revealed thickening of the cortex and endosteum of the first phalanx. In the distal volar and medial portion of the shaft adjacent to the articular cortex, an expanded translucent zone of bone was seen, in the center of which there appeared to be a nidus. Associated marked swelling of the soft parts could be seen about the involved area.

Following surgical excision approximately 1 year after the onset of symptoms, the patient obtained complete relief from pain, and the swelling gradually subsided. Histologic examination showed the typical appearance of an osteoid osteoma.

Case 3. A 62-year-old woman complained of pain, swelling, and disability of the right wrist of 6 months' duration. There was no history of injury. On examination there was minimal swelling and localized palpatory tenderness over the distal radius. Active and passive motions of the wrist joint aggravated the patient's symptoms. The pain was worse at night.

Radiographic studies revealed the presence of a nidus on the lateral side situated in the distal radial shaft. Demineralization was noted about this area. There were no periosteal proliferative changes or expansion of bone.

Complete and permanent relief of pain and disability followed surgical extirpation of the nidus. Microscopic examination revealed the characteristic appearance of osteoid osteoma.

Case 4. A male, 24 years of age, reported that the onset of pain and disability in his right ankle occurred 7 months prior to examination following his having jumped and forced his foot into extreme dorsiflexion. The pain at first was intermittent but had gradually increased in severity and had become more persistent and severe, being worse at night.

Radiographic studies revealed a rounded, smoothly demarcated fragment situated in the superior aspect of the anterior process of the talus. The area was surrounded by a translucent zone which was bordered by a condensing reaction.

Surgical removal of the nidus, 2½ years following the onset of symptoms, gave complete and permanent relief of pain. Histologic appearance was typical of osteoid osteoma.

CONCLUSION

Although the exact nature of osteoid osteoma is still unknown, there is little doubt that the condition represents a distinct clinical entity. If the patient's history, clinical findings, and radiographic studies substantiate the diagnosis of osteoid osteoma, the only effective treatment is surgical excision of the nidus, irrespective of the fact that these lesions heal spontaneously.

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Intramedullary Nailing of the Tibia in Relationship to Avascularity at the Fracture Site

With a Review of Eight Cases

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The use of heavy nails that filled the medullary canal for immobilization of fractures of the long bones was introduced by Hey Groves[1] in 1916 in England. It is stated that he was defeated in his efforts by the imperfections of metals available at that time, and it was only after the development of biologically inert alloys that interest in intramedullary nailing was again revived. In 1937, Rush[2] began reporting the use of flexible rods as a means of internal fixation. Küntscher[3] reported on his operative treatment with an intramedullary nail of his own design in 1940. Küntscher's method consisted of the insertion of a medullary nail through a small incision some distance from the fracture site, so that the nail traversed the medullary canal and firmly stabilized the reduced fracture. He compared this method of internal fixation with the extra-articular nailing of femoral neck fractures.

The impetus of intramedullary nail fixation was furthered by the appearance in 1948 of "Medullary Nailing of Küntscher," an English translation of a text by Lorenz Böhler.[4] Intramedullary fixation in selected femoral shaft fractures appears to have become an accepted method of therapy, but the literature on the nailing of fractures of the tibia is very confusing. Many well-known orthopedists are firm advocates of the nailing of specific fractures of the tibia. Lottes,[5] Haebler,[6] Soeur,[7] vom Saal,[8] Westerborn,[9] and Massie,[10] to name but a few, are satisfied with their successful experiences in using intramedullary fixation for tibial fractures. However, in 1949, L. and J. Böhler[11] reported the following:

> Sometime ago, feeling that our results were unsatisfactory in fractures other than those in the femur, we reviewed all of our cases. The review indicated that, in bones other than the femur, the results were better by conservative methods than with nailing. . . . the authors have completely abandoned the use of the intramedullary nail in the tibia.

In order to see for ourselves what results were, we nailed a small number of tibias at the Los Angeles County Osteopathic General Hospital over a 9-month period. This series of cases, while not very large, was thought to be of sufficient interest to report, as it raised a question which has received little attention when the nailing of tibial fractures has been discussed. Therefore, this paper is not concerned with the technics or all of the pros and cons for nailing of the fractured tibia, but only with personal observation in regard to one factor.

CASE REPORTS

Case 1. A 26-year-old female was involved in a collision of two cars on October 25, 1952, with resultant trauma to the left lower extremity. There was a 2-inch wound over the anteromedial aspect of the left midshin. X-rays revealed a comminuted segmental fracture of the middle third of the left tibia with associated fibular fractures (Fig. 1). Approximately 10 hours following the accident the wound area was thoroughly irrigated and debrided, followed by loose closure. On completion

Fig. 1

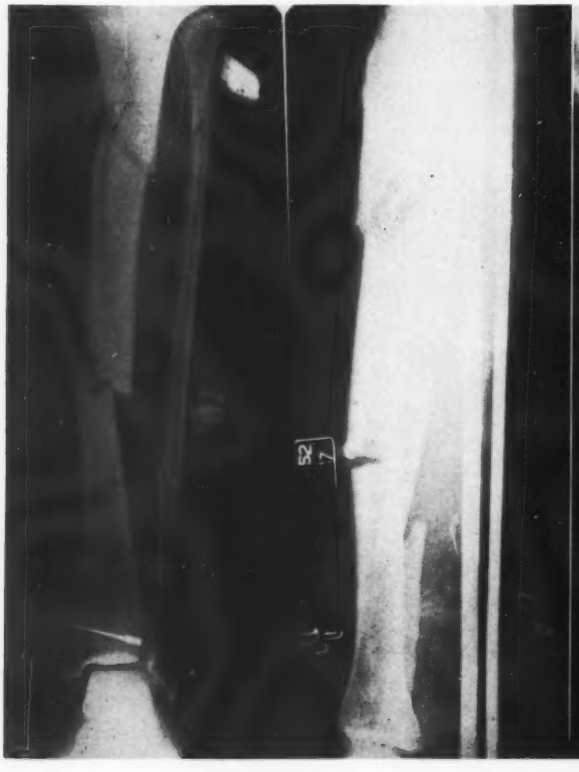


Fig. 2

Fig. 3

Fig. 4

of the surgery, calcaneal skeletal traction was applied and the extremity placed in a Braun frame. The wound healed kindly, and on November 19, 1952, an open intramedullary fixation of the left tibia with one Küntscher nail and four doubled circumferential wire loops was performed. The postoperative period was uneventful and the patient was discharged to the care of an orthopedist, as she was ineligible for further County Hospital care.

At the time of discharge the patient was ambulating in a below-the-knee plaster cast, with full weight-bearing. Approximately 6 months postoperatively, x-rays obtained from her attending physician showed satisfactory progress in healing (Fig. 2). The physician related that the patient had been out of all plaster immobilization for the past 3 months and had excellent function of the affected extremity. Although results such as are seen in this case are frequently ascribed

Fig. 5a

Fig. 5b

Fig. 6

Fig. 7a

Fig. 7b

Fig. 8

to the new method of fixation, the good results should frequently be ascribed to unusually fortunate circumstances, because such segmental fractures are usually completely sequestrated by any type of extensive open procedure.

Case 2. A 54-year-old male was involved in the collision of two cars on November 14, 1952, with resultant trauma to both lower extremities. Clinical examination supplemented with x-rays (Fig. 3) revealed a 2-inch compound transverse fracture at the junction of the proximal and middle thirds of the right tibia and fibula. The left lower extremity presented a compound comminuted fracture of the left patella, which will not be considered further as it does not concern the topic under discussion. Approximately 8 hours after admission and following irrigation and debridement of the wound, internal fixation of the right tibia was achieved with two Küntscher nails. The incisional site healed kindly, and the patient was discharged in an ambulatory cast approximately 2 weeks after surgery. The postoperative period was uneventful up until the eighth week, when a mild, clear drainage was observed adjacent to the incision. Smears and cultures were continually reported as negative for pathogens, and extensive antibiotic therapy had no appreciable influence on the drainage. Approximately 1 year following the original surgery, bony union appeared satisfactory and the intramedullary nails were removed. The extremity was clinically solid, and no further immobilization was necessary (Fig. 4). The patient was last seen in April, 1954, at which time his only complaint was intermittent drainage from the right tibia. Function of the extremity was good. Further surgery (sequestrectomy) was discussed with the patient, but he declined it and has since been lost to follow-up.

Case 3. An 18-year-old male was struck by a car on April 2, 1953, with resultant trauma to the right lower extremity. The skin was intact, and x-rays revealed a comminuted (butterfly) spiral fracture of the right midtibia with associated fibular fractures (Fig. 5a). Since attempts at closed reduction were not satisfactory, an open intramedullary fixation with two Rush nails was performed on April 13, 1953 (Fig. 5b). The patient had an uneventful postoperative period and was ambulatory with full weight-bearing approximately 3 weeks after surgery. X-rays (Fig. 6) showed satisfactory union, and function of the extremity is excellent.

Case 4. A 60-year-old male was struck by a car on April 14, 1953, with resultant trauma to the left forearm and right lower extremity. Attention will be directed to the right lower extremity, which presented a compound comminuted fracture of the distal third of the tibia with associated fibular fractures (Fig. 7a). The wound was loosely closed following irrigation and debridement. Calcaneal skeletal traction with the extremity on a Braun frame for approximately 3 weeks resulted in primary healing of the wound, at which time the tibia was internally fixed with two Küntscher nails (Fig. 7b). The postoperative period was uneventful until approximately the ninth week, when spontaneous drainage occurred over the lower canthus of the incision. Results of smears and cultures were negative, and antibiotics were of no avail in combating the drainage. The patient continued in long leg plaster immobilization with partial weight-bearing for approximately 6 months, at which time the intramedullary nails were removed. The extremity was resilient following removal of the nails (Fig. 8), and plaster immobilization was continued. Drainage did not cease following removal of the nails, but fracture consolidation was such that the extremity was placed in an ambulatory brace approximately 10 months following the original surgery. Drainage has diminished, but still persists at this late date. It is hoped that the sequestra will eventually be absorbed without the necessity of resorting to further surgery.

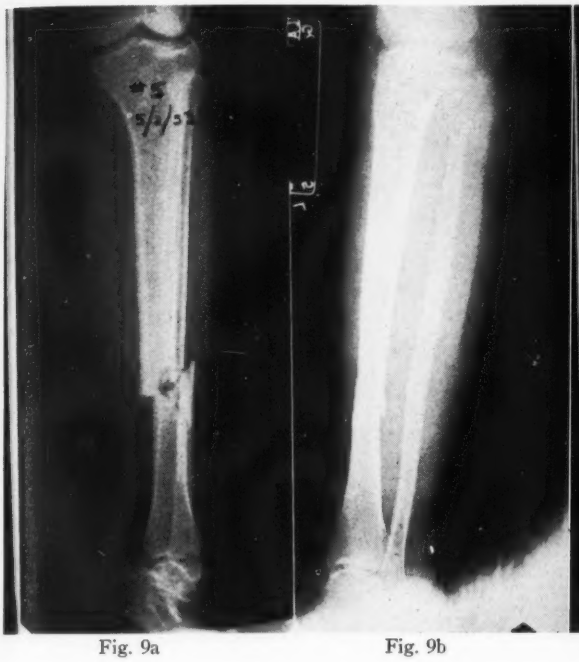


Fig. 9a

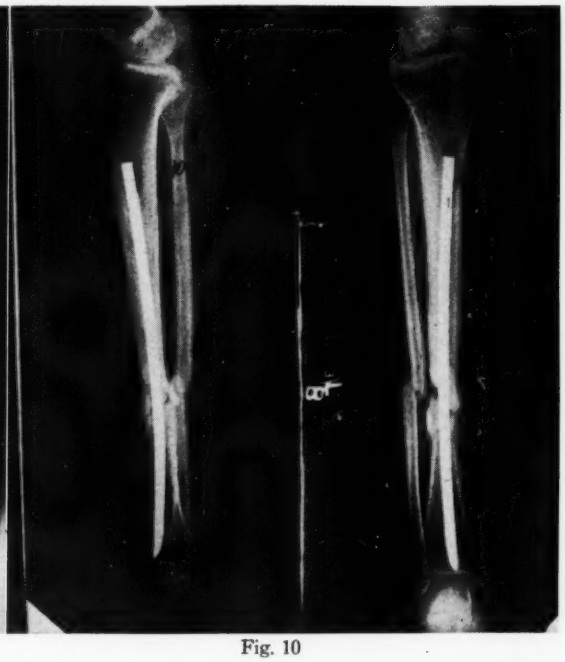


Fig. 9b

Fig. 10

Case 5. A 38-year-old female was hit by a car on May 1, 1953, with resultant trauma to the left lower extremity. The skin was not broken and x-rays disclosed a comminuted (butterfly) fracture at the junction of the middle and lower thirds of the left tibia (Fig. 9a). On May 11, 1953, internal fixation was accomplished with one Küntscher intramedullary nail (Fig. 9b). The postoperative period was uneventful; the patient was ambulatory in a plaster legging for approximately 6 weeks. The patient was last seen in October, 1953, at which time she was painlessly ambulating with full weight-bearing even though roentgenographically she did not have a well-established endosteal union (Fig. 10).

Case 6. A 40-year-old female fell from a bicycle with resultant trauma to the right lower extremity on June 9, 1953. The skin was intact and x-rays disclosed an oblique fracture of the right distal tibia, undisplaced fracture of the posterior malleolus, and a fracture of the proximal fibula (Fig. 11a). Closed reduction was deemed unsatisfactory, and on June 12, 1953, open reduction and internal fixation was performed with one Rush and one Küntscher nail introduced from the ankle area (Fig. 11b). Plaster immobilization was continued for approximately 10 weeks postoperatively, and the patient was advised to bear weight to tolerance. The immediate postoperative period was uneventful. However, distraction prevailed at the fracture site and in May, 1954, all internal fixation was removed and the patient returned to plaster immobilization. The extremity was immobilized for another 7 months, at which time no osseous restoration had occurred (Fig. 12). A massive sliding bone graft was performed in January, 1955, which has resulted in a successful union (Fig. 13).

Case 7. A 27-year-old male was struck by a car with resultant trauma to both lower extremities on June 7, 1953. Clinical examination supplemented by x-rays

Fig. 11a

Fig. 11b

Fig. 12

Fig. 13

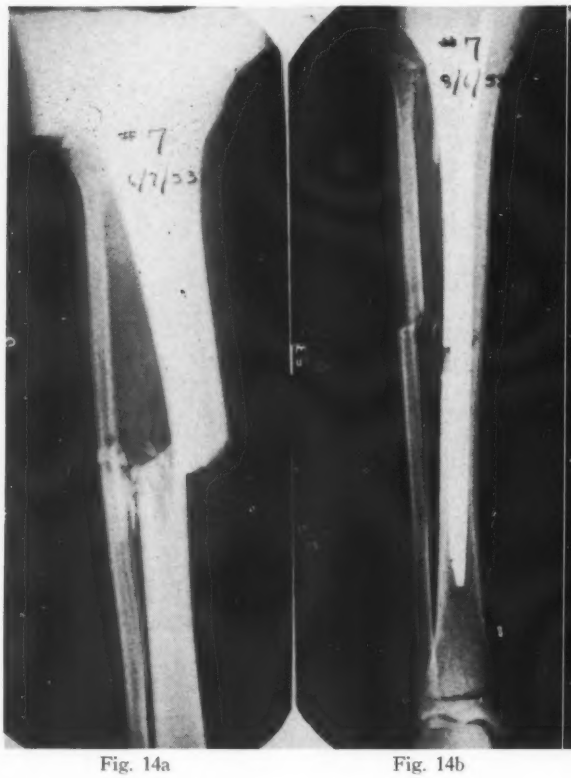


Fig. 14a Fig. 14b

Fig. 15a Fig. 15b

revealed a closed comminuted fracture of the right midfemur, a 2-inch compound comminuted fracture of the right midtibia (Fig. 14a), and a 3-inch compound transverse fracture of the left midtibia (Fig. 15b). The original therapy was primarily directed to the treatment of shock and in part consisted of debridement, loose closure, and skeletal traction (bilateral calcaneal and right supracondylar). Approximately 3 weeks following the original trauma, primary healing of the compound sites had occurred, and the patient was taken to surgery where both tibias (Figs. 14b and 15b) and the right femur were nailed. A "pin lock" occurred during the driving of the second nail into the left tibia, but as the nail had progressed far enough for a stable reduction, the protruding end was cut off subcutaneously. The postoperative period was uneventful, and the patient was discharged in short plaster boots with instructions to pound the heels frequently. Approximately 4 months postoperatively spontaneous drainage occurred over the fracture site in the left tibia. Smears and cultures revealed no pathogens, and antibiotics had no influence on the drainage. On January 21, 1954, the nails were removed from both extremities. A partial ostectomy of the right midfibula was performed at this time in an effort to compensate for distraction at the fracture site of the right tibia (Fig. 16a). Both extremities were returned to plaster immobilization following this surgery. The left tibia continued to drain profusely, and a sequestrectomy was done in March, 1954 (Fig. 17a). The right tibia showed no evidence of union approximately 1 year following the original surgery and on June 28, 1954, a sliding bone graft was performed which resulted in a successful union (Fig. 16b). The left tibia, which had continued to drain intermittently since the sequestrectomy in March, 1954, was submitted to saucerization and sequestrectomy on February 25, 1955 (Fig. 17b), and at present is undergoing Orr pack therapy.

TABLE I—RESULTS OF NAILING OF EIGHT TIBIAS

Case	Compound Fracture	Interval before nailing	Outcome
1.	Yes	3 weeks*	Uneventful healing
2.	Yes	8 hours	Delayed union Persistent drainage
3.	No	2 weeks	Uneventful healing
4.	Yes	3 weeks*	Delayed union Persistent drainage
5.	No	10 days	Uneventful healing
6.	No	3 days	Nonunion, bone graft
7a.	Yes	3 weeks*	Nonunion, bone graft
7b.	Yes	3 weeks*	Delayed union Persistent drainage Sequestrectomy and saucerization

*Following original debridement and closure.

DISCUSSION

This small series of nailed tibias definitely did not cause the members of the Department of Orthopedics at the Los Angeles County Osteopathic General Hospital to become advocates of intramedullary fixation for fractures of the tibia. It was concluded that complications would occasionally arise in the nailing of tibial fractures due to one factor. This factor, which has received little attention, is the probability of additional trauma to the nutrient artery of the tibia as a result of this type of internal fixation.

The active adult bone cells take no active part in the process of regeneration of bone following a fracture. Bone formation always begins in the fracture site

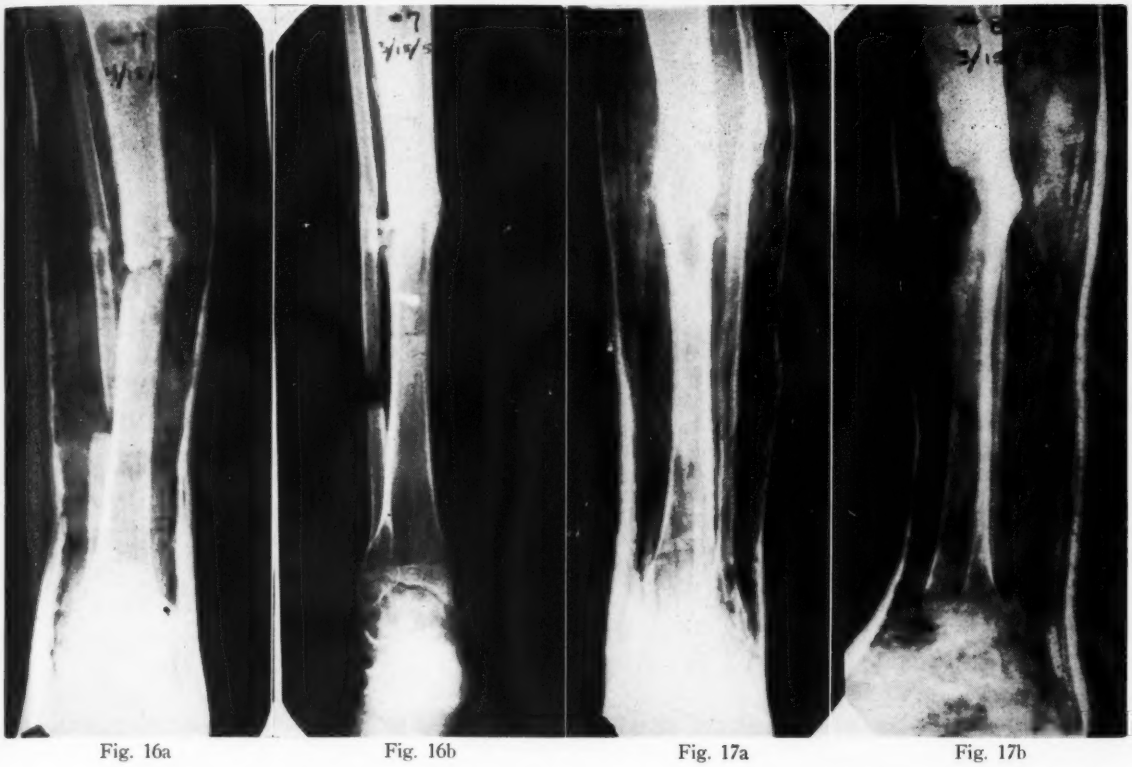
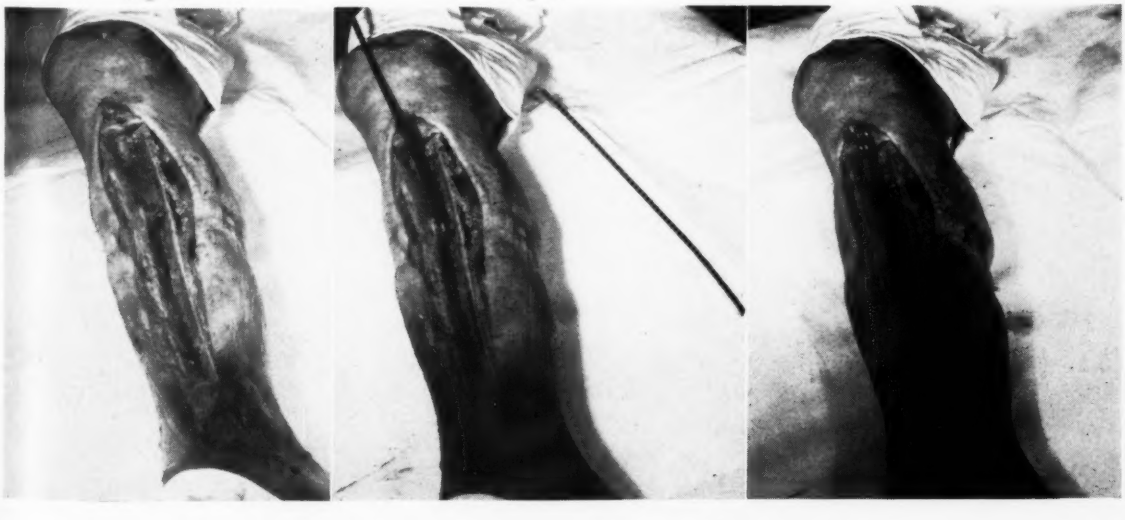


Fig. 16a Fig. 16b Fig. 17a Fig. 17b

by the proliferation of the periosteum and endosteum at some distance from the line of the fracture and grows into it by extension from these tissues. The new bone formation can be assumed to originate from cells which are linear descendants of osteoblasts. These osteogenic cells are found lining the deep layer of the periosteum and the endosteum. The process begins with the formation of fibrocartilagenous tissue between the fracture fragments. The major portion of the mass of fibrocartilage appears to be derived from the osteogenic cells. Its appearance is the preliminary step in the bridging of the fracture. Thus, a cartilagenous model is first formed, new capillaries are drawn into the substance of the cartilaginous callus, and bone formation begins as soon as contact has been established between the cartilage and young perivascular connective-tissue cells. The vascular network by which the building materials for repair are carried to the fracture site is certainly one of the most vital necessities in the repair of a fracture.

The nutrient artery to the tibia arises from the posterior tibial artery and enters the medullary canal posteriorly near the junction of upper and middle thirds of the shaft. Once in the medullary canal the main branch of the nutrient artery runs distally (Fig. 18). The nutrient artery is the chief source of supply for the nourishment of the marrow endosteum and inner third of the compacta of the tibial diaphysis. The meta-

Fig. 18 Fig. 19 Fig. 20



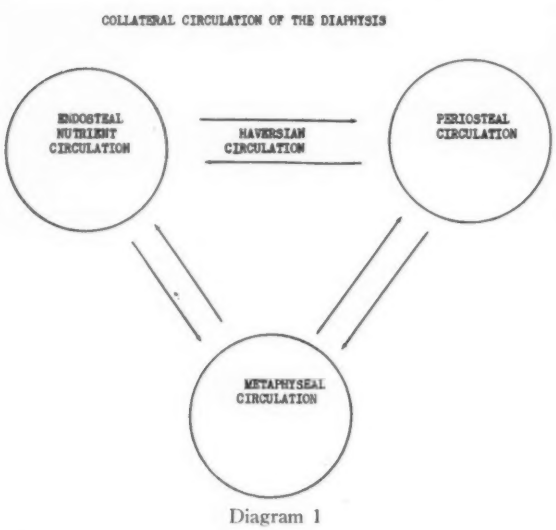
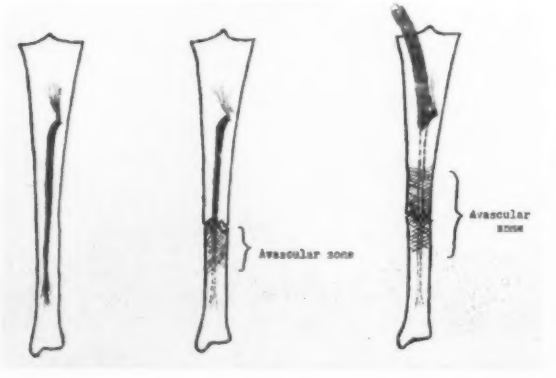


Diagram 1

physeal vessels mainly supply the metaphysis and a small adjacent area of the shaft, except for the central diaphysis. The periosteal plexus supplies the outer two thirds of the compacta. It is important to appreciate that when a fracture occurs in the diaphysis of the tibia, the nutrient artery is not infrequently divided, which seriously interferes with the blood supply to the distal fragments. In these instances the activity of the collateral circulation by alternate routes is all-important (Diagram 1).[12]

The distal fragment of a diaphyseal fracture in the tibia with an interrupted nutrient artery will depend almost entirely upon a collateral metaphyseal circulation, as the periosteal circulation is the most delayed and very unreliable. The proximal fragment in the same hypothetical fracture will, however, continue to receive an adequate circulation, as it will continue to have an intact nutrient artery (Diagram 2). Thus, in the usual diaphyseal fracture of the tibia there is an adequate circulatory status of the proximal fragment but a relatively avascular site at the distal fragment. The circulatory inadequacy of the distal fragment constitutes one of the major premises for the slow rate of union (and occasional nonunion) in these fractures which have been satisfactorily reduced and immobilized. If, in addition to the relatively avascular distal fragment in our hypothetical fracture, the proximal fragment was deprived in part of its blood supply (nutrient artery), the fracture area would be composed of two relatively avascular zones (Fig. 18). Such a fracture must depend upon the remote collateral circulation for a successful union. If an adequate collateral circulation is not available to the fracture site, union will be delayed and complete healing with recanalization must await the replacement of devitalized bone by "creeping" substitution.[13]

Diagram 2



The upper and lower thirds of the tibia have funnel-shaped canals; the middle third has a straight narrow canal. An intramedullary nail introduced into the canal tends to run along the posterior aspect of the canal, rendering the nutrient artery quite susceptible to trauma some distance proximally from the fracture site (Fig. 19). Also, the introduction of one or more nails completely filling the narrowed portion of the canal could, by pressure alone, impede the circulation of the nutrient artery distally (Fig. 20). It is not proposed that the nutrient artery is traumatized in every nailing of the tibia, with a resultant avascular zone, but that it can and will occasionally happen in a large percentage of the presented cases is evident.

In Case 7 in which a bone graft was subsequently required to correct the nonunion, exposure of the proximal intramedullary canal at the time of surgery revealed the fibrotic remnants of the nutrient artery. As it extended proximally some distance from the ununited fracture site, it was in all likelihood injured at the time of original nailing and contributed to the nonunion. Watson-Jones[14] has stressed the importance of the re-establishment of the endosteal collateral circulation after division of the nutrient artery and ascribed to this fact the delayed appearance of endosteal as compared with periosteal callus. The marked lag in endosteal reossification, which if it did appear, occurred long after periosteal bridging, was repeatedly demonstrated in this series of cases. Periodic x-ray studies also showed a marked cortical sclerosis extending some distance on both sides of the fracture site as evidence of a deficient nutrient artery supply. The incidence of nonunion was not reduced in this small series of cases and delayed endosteal union was quite prominent. Other than delayed union and nonunion, another complication arose as a result of the relatively avascular zone surrounding the fracture site. Late sterile drainage (Cases 2, 3, and 7) was due to the relatively avascular environment in which portions of the endosteum and inner compacta (possibly damaged during the nailing) underwent avascular necrosis with eventual sequestration and drainage. Central sequestra are relatively unknown in any other type of internal fixation, because of the usual avoidance of additional trauma to the nutrient artery.

The incidence of avascular changes in this series of cases was greatly enhanced by the use of the open technic with its unavoidable trauma to the periosteum and soft tissues. The periosteal plexus is derived from the fascial and muscular twigs adjacent to the tibia and supplies the outer two thirds of the compacta. Kolodny[15] has shown in animal experiments that if the periosteal vessels about a fracture are damaged, especially if the violence concomitantly severed the nutrient artery, nonunion always resulted. Johnson[16] has also experimentally proved that an intact periosteal plexus will not prevent marrow necrosis when the medullary canal is completely blocked. Thus, it would appear that central sequestra are occasionally unavoidable even with the closed technic of nailing.

The use of intramedullary fixation for fractures of the tibia has been abandoned at this institution on

the basis of results from this series of cases. It is felt that the definite possibility of additional trauma to the nutrient artery as a result of this type of internal fixation may lead to complications far outweighing those encountered with the usual modalities. Our incidence of union was not increased, and delayed endosteal union was quite prominent. This, together with the high incidence of sequestral drainage, was convincing evidence that the usual methods of internal fixation gave better over-all results in fractures of the tibia.

SUMMARY

1. A small series of fractures of the tibia in which intramedullary fixation was used is presented.

2. The blood supply and its relationships to the healing of tibial fractures is briefly reviewed.

3. The possibility of deleterious effects to the nutrient artery of the tibia as a result of intramedullary fixation is proposed.

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DISCUSSION

Jack D. Hutchison, D.O., Columbus, Ohio: I would like to compliment Dr. Segel on an excellent presentation, and especially on the originality of his thinking relative to a method of fracture fixation which has become increasingly popular since the work of Böhler during World War II. Dr. Segel is also to be commended for the honesty of his conclusion that intramedullary fixation of the long bones is beset with many complications, since I know from past association with him that he was quite enthusiastic about this method of fracture treatment.

Although there are many advocates of intramedullary fixation of fractures, I think the least enthusiasm has been shown for its use in fractures of the tibia. It is now generally accepted that fractures of the femur have been most successfully treated by this method.

Even though this series is small, I believe there is both theoretical and clinical proof that when the surgeon becomes dependent on gadgets rather than on manipulative skill in the management of fractures he violates the basic laws of physiology and orthopedic common sense. The end results are prolonged disability, delayed union, and possible infection, to say nothing of the economic loss. On the other hand, economic urgency itself is not sufficient reason for open operation. Open operation, whether fixation is by intramedullary nail, plates, or screws, should be done only where it will obviously give a better chance for healing and good functional end result.

My own experience in orthopedic surgery is of relatively short duration, and my experience with all intramedullary fixation is necessarily limited. For this reason, I choose to adhere to the conservative method of closed reduction and plaster immobilization whenever possible, and always in those cases in which the advantage of any other method of treatment is questionable.

In searching the literature, I find nearly all of the accepted authorities, especially in this country, have expressed their thinking regarding surgical intervention in fracture treatment pretty much in the terms of McElvenny:[1]

> A gadget is an impersonal thing having no purpose or intent in its make-up. Its effectiveness lies in the intelligence and the skill of the user, for it is powerless to do the work of either nature or the physician. Since a gadget is a means, not an end, it should be used only as an aid to nature.

117 W. 3rd Ave.

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BODY POSTURE—BODY MECHANICS

According to Baker it was development of a true foot that gave man his opportunity to develop his remarkable superiority over other primates, who really possess four hands. With the development of his upright posture came the increase in the size of the brain and the great increase in intellectual powers. Goldthwait was one of the first clinicians to recognize the relation between the erect posture and health and to insist on the correction of body mechanics as an important part of the treatment of chronic diseases.

The tilt of the pelvis, which is controlled partly by the abdominal muscles but largely by the muscles which control the position of the pelvis with relation to the femurs, causes variation in the compensatory curves of the spine, and postural strains result, followed by traumatic arthritis, particularly when there is sharp angulation at the lumbosacral junction.

The cervical portion of the spine developed its curve, with the resulting balance of the head on the spine, very late with respect to other changes.

The midcervical portion of the spine, where the anterior curve is marked, is the point of the most constant strain. Arthritis and narrowing of intervertebral spaces are common between the 5th and 6th cervical vertebrae and to a less extent between the 4th and 5th. Strain or changes in the angulation in any of the spinal curves which tend to cause decrease in the size of the foramina result in irritation of sensory nerves, and cause radiating pain. Radiation around the trunk frequently causes pain which simulates visceral disease.

Body mechanics means the mechanical correlations of the various systems of the body with especial reference to the skeletal muscles and their association with the nervous system. Postural disturbances lay the mechanical foundation for future strains, injuries and infections.—Philip Lewin, M.D., in The Back and Its Disk Syndromes.

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Fractures of the Hip*

A Five-Year Survey of Hip Fractures and The Advantages of Professional Teamwork

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A little over 5 years ago a more extensive professional service was started at Detroit Osteopathic Hospital in an effort to improve the care in hip fractures. The objective was to discharge the patient with a fractured hip in better general systemic condition than before admission, as well as to attain a higher percentage of bony union in these difficult fractures.

It is interesting to note that at the time of its first conclave in 1941, this Academy heard Dr. A. C. Johnson[1] discuss "Indications for Surgical vs. Nonsurgical Management of Hip Fractures."

In 1944 one of us[2] reviewed for the Academy the status of hip fractures and the classifications of that time, stating that hip fractures could be classified then as they are today into intracapsular and extracapsular fractures. A second classification which was used at that time, the so-called abduction and adduction fractures, is today recognized as descriptive only of varying degrees of impaction and malalignment of the same fracture.

Watson-Jones[3] has a new classification which we think is much more practical:

1. Fractures in children without displacement
2. Fractures in the middle-aged patient with first degree displacement and impaction
3. Fractures with fragmental displacement in the elderly patient whose bones are porotic
4. Fractures in the young adult with displacement and capsular tear.

This classification suggests in principle the type of therapy for the various groupings.

In the first group, children, very rarely is surgical intervention necessary.

In the second classification, the middle-aged patients with first degree displacement and a moderate amount of impaction, surgery is not necessary at times.

In the third division, immobilization by means of internal fixation is indicated to achieve the best surgical results in the elderly patient. Because of the degenerative processes of advanced age, we have found that preoperative teamwork with the internist has been a tremendous aid in the orthopedic management of this type of fracture.

In the fourth classification, the severity of a capsular tear can only be estimated, but it should be evaluated as carefully as possible. The fracture should be immobilized by means of internal fixation as early as possible following injury, for movement of the bone fragments can add to the damage to the small capsular arteries which were injured at the time of the accident.

The poor circulation to the cervical neck fracture should be continually kept in mind. The major portion of the blood supply is derived from the capsular arteries, which may be seriously injured at the time of the fracture, and a small amount of blood is derived from the fovea capitis femoris arteries of the ligamentum teres. The greater the injury to either or both of these blood supplies, the greater is the possibility of aseptic necrosis.

In addition to this orthopedic consideration in the elderly, it can hardly be expected that bony union will take place in the presence of serious pathologic conditions such as diabetes and various circulatory disorders. This, then, is the reason our 5-year survey was started; it is not regarded as completed, but merely the beginning of a continuing study of a serious orthopedic problem frequently encountered in elderly people.

This survey totals 145 cases, of which 90 were intracapsular fractures and 55 were extracapsular. In other words, 62 per cent were intracapsular fractures, which are by far the more serious type of hip fractures. Twelve patients were less than 50 years of age, 59 were between the ages of 50 and 70, 39 between 70 and 80, and 35 were over 80 years of age.

The teamwork starts immediately upon the patient's admission to the hospital and continues throughout his stay. There is a standing order that all patients with hip fracture be studied as rapidly as possible upon admittance. We consider this work as important as the taking of x-rays upon admittance. With all possible haste the patient is prepared for whatever therapy is indicated, usually reduction and immobilization by means of internal fixation.

It is not our intent to discuss the various types of immobilization technics. Each individual should fix the fracture with the nail or screw of his choice, the one which he can apply most accurately and most quickly. It is interesting to note that when the Smith-Petersen nail was introduced in 1931[4] it was the first demonstration of a coordination of effort between the physicist and the orthopedist in the development of a noncorrosive, nonirritating alloy which could be used for internal fixation without the fear of its having to be removed at a later date. Since Smith-Petersen introduced this three-flange pin, screws of all types and plates for intertrochanteric and subtrochanteric fractures have been devised, far too many to enumerate. On our service we prefer a specially designed Moriera stud bolt or a Jewett nail; these seem to be the most satisfactory of the many different types we have tried.

As soon as the internist has the case prepared for surgery, the second and third steps of our teamwork are demonstrated in that in all cases anesthesia is administered by a physician specializing in anesthesiology and the aid of our roentgenologist is utilized. We do all hip pinning with the patient on the orthopedic table, using the Leadbetter[5] technic to reduce the fracture, and permanently secure the injured extremity in a position of abduction with the foot internally rotated sufficiently to maintain the femur in as level a position as possible with the patient's body. Two portable x-ray

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machines are positioned before surgical preparation is made, and the conventional incision is made on the subtrochanteric area of the femur. This demonstrates the second type of teamwork—an experienced surgical team which, in our case, consists of an orthopedic scrub nurse and our residents who are well acquainted with our technic, thus speeding up the orthopedic procedure. The other members of the operating room team are the interns and the circulating nurse.

Thus we have not only more thoroughly prepared the patient for surgery but also have an operating room team thoroughly acquainted with the operative procedure and a surgical technic which can bring about a reduction and immobilization with a minimum of trauma and a maximum of speed.

Immediately following surgery the internist takes over the medical management of the case, and since this has been the procedure there have been very few problems with our patients with hip fractures. Usually they leave the hospital in a much better state of health than when they enter.

However, complications and unusual problems do arise. At the present time we have on our service an 80-year-old diabetic patient with an uncomplicated intertrochanteric fracture (extracapsular). The internist prepared her for surgery, which was conducted without complication. Postoperative recovery was uneventful. The patient left the hospital with the diabetes under control and was placed in a nursing home. As so frequently happens, the diabetes soon got out of control. Six months later she was rehospitalized; her blood sugar was well above 200 mg. per 100 cc., and the fracture was not healed. This points out the necessity of continuing the teamwork after the patient leaves the hospital by impressing upon the referring or the attending physician his responsibility to the patient in maintaining whatever medical management has been instituted during the hospital stay.

We cannot equal the high degree of success reported by Watson-Jones[3] who during the last 10 years has had no deaths due to hip pinnings, but we are proud of the fact that we have had only three patients whose deaths could be in any way attributed to the surgical procedure of hip pinning. In each of these three cases the degenerative processes of old age were so advanced that the deaths could not be entirely ascribed to the operation.

Rather radical treatment of fresh fractures at the present time consists of removing the femoral head in intracapsular and subcapital fractures and replacing it with a prosthesis. We agree with Dickson[6] who terms this procedure a deplorable technic and one which marks defeatism. He advocates use of cancellous bone at the fracture site and securing it with a Jewett nail.

Neither aseptic necrosis, so frequently encountered in intracapsular fractures, nor the technics which have been developed to deal with it will be discussed in this paper. However, development of subtrochanteric osteotomy and modern prosthesis permits a better selection of procedures than was available a decade ago.

Our analysis of hip fractures, although not complete, has convinced us that the following principles must always be considered:

1. The patient must be evaluated, both from an orthopedic standpoint and from a medical standpoint, at as early a date as possible after the fracture, and the injured hip should be maintained with a minimum of motion during this evaluation period.

2. An exacting, rapid technic of reduction and immobilization must be conducted by an experienced team as soon as the patient's general condition warrants, and the immobilization apparatus must be accurately applied.

3. Medical management by a competent internist or general physician must be continued postoperatively until convalescence is completed.

4. A more detailed study of hip fractures should be conducted in order to ascertain the best method for securing a higher degree of bony union.

We hope to make a further report on this continuing study of hip fractures. There are many phases which we are studying but at present our statistics are too incomplete to be reported.

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Hip Fractures—A Problem of the Aged

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THE GENERAL PROBLEM

Upon review of 145 cases of hip fracture treated in the past 5 years at the Detroit Osteopathic Hospital, it was startling to find that 75 per cent of patients above the age of 90 years had been salvaged. Perhaps one of the factors responsible is that in orthopedics as well as in all other fields of medicine, the geriatric patient has commanded progressive attention and interest in recent years.

The simple physiologic changes attendant upon the aging process provide these people with unique properties which predispose them to particular diseases and complications. Among these are fractures of the proximal femur involving the neck and trochanter. These fractures are of interest because they provide a crisis of such magnitude that they may threaten the life of the patient. During earlier years of medicine they were regarded only as a mechanical problem of the osseous system and were dealt with entirely by the orthopedist, who calculated carefully and focused his attention upon improvement in procedures which might promote the greatest comfort and most adequate healing.

With excessive frequency these patients were afflicted not only with the usual physiologic changes of aging, but with other pathologic processes of a cardiovascular, metabolic, psychologic, or nutritional nature.

These patients were categorized as poor surgical risks and treated with the "more conservative" measures. External fixation procedures invariably immobilized the entire body and thereby usually marked the beginning of the end for the unfortunate victims. The associated morbidity and mortality rates, although high, failed to rally the attention of the allied specialty groups until recent years.

An improved philosophy of approach to hip fracture in the aged has accrued from recognition of the multiple ramifying facets provided by this condition. Information has accumulated as a result of the remarkable strides made in the past half century. This progress is well reflected in the growing life expectancy through this period. As late as 1900, the average life expectancy was only 50 years. Today this figure has climbed impressively to an average life expectancy of about 68 years.[1]

The senescent population has progressively increased, and scientific probing for explanations of structural and functional changes noted in the process of aging has become proportionately intensive. Careful evaluation reveals that many of the fundamental processes operative in the aging phenomenon have yet to be clearly defined. It is obvious, however, that a considerable degree of elasticity is lost in this process. The dynamic evolutional cellular changes seem to fall behind the pace of involution. As a result, parenchymal cells become fewer in number, and fibrous, relatively nonelastic stromal cell replacement occurs. These degenerative changes are invariably insidious. The rate at which they progress appears extremely variable from one individual to another. It becomes difficult to establish the fine line of demarcation between degenerative physiologic processes and pathologic processes.

All of these factors must be considered and understood in order for a rational philosophy to be established for the most successful reconstruction of the patient as a unit. It must be understood, further, that the structural degenerative changes provide the background for functional changes. Degenerative vascular changes predispose to arteriosclerosis. Diminished blood supply to parenchymal tissue follows, and fibrous replacement of cells is accelerated. The functional capacity of all the various systems is accordingly reduced. Fewer glomeruli operate in the renal system so that increased loads of waste products, such as may occur in a crisis, will result in abnormal elevation of blood nitrogenous products. Cardiac reserve is reduced so that increased demands of only a minor degree may precipitate decompensation. Transient episodes of cerebral ischemia produce disorientation. Circulatory stasis readily predisposes to thrombosis. Variable degrees of osteoporosis become manifest throughout the skeletal system, and various expressions of metabolic deficiencies occur.

The fact that these fractures occur most frequently in persons between the ages of 60 and 90 years is no mystery when the degenerative changes common to this group are considered. As the homeostatic mechanisms become progressively inefficient, the aged individual does not enjoy the acute sensibilities and neuromuscular irritability necessary for maintaining his equilibrium under unusual strain. Although the hip joint is basically a sound one mechanically, it represents one of the weakest points in the geriatric skeleton. Thinning of the osseous trabeculations reduces lines of stress and strain. Relatively minor direct trauma or sudden torsion of the long lever provided by the lower extremity results in a fracture of the proximal femur. The physiologic degenerative changes which occur in the process of aging directly or indirectly contribute to the fracture and cannot be divorced from the therapeutic management in returning the patient to a normal functioning unit.

The fundamental principles for adequate healing of the hip fracture itself do not differ from those for fractures anywhere else. The orthopedist is concerned with obtaining adequate alignment and immobilization of the fragments so that physiologic processes may provide union with callous formation. However, because of the anatomic relationship at this site, hip fractures pose a problem relative to fixation. In order to maintain complete immobilization of the fragments by external methods, practically the entire remainder of the body must be in a state of relative fixation. Among the methods which have been devised to accomplish this purpose are Jones' boots, single and double hip spica, and Russell traction. Unfortunately, all of these devices necessitate immobilization of the major portion of the body, which is obviously hazardous in the aged individual. Mortality with these methods has been high, and morbidity has been extreme. The common more benign complications which prolong rehabilitation as a result of these methods are decubitus ulcers, impaired gastrointestinal motility, psychosis, and arthralgia. The more profound complications which are usually fatal include hypostatic pneumonia and pulmonary embolism. The latter usually arises from an area of phlebothrombosis, although occasionally a fat embolus arises from the site of fracture. These pathologic mechanisms indicate unquestionably the necessity for avoiding all procedures which tend to promote vascular stasis.

Local fixation provides the only expedient through which relatively complete immobilization of the patient for lengthy periods may be avoided. The specific modality for internal fixation depends entirely upon the judgment of the orthopedic surgeon. The obvious advantage of internal fixation is that it permits early mobilization of the patient. Unfortunately, it provides the added hazards of anesthesia and a major surgical procedure for the already burdened senescent body. Unfortunately also, the patient, his family, and even the physician may regard this procedure as radical. In reality, with carefully planned premedication and anesthesia based on carefully evaluated functional capacity of the cardiac, pulmonary, hepatic, and renal systems, the risk may be reduced to levels comparable to many major surgical procedures in younger patients.

GROUP RESPONSIBILITY

The foregoing facts certainly indicate that hip fractures in the aged constitute far more than a simple orthopedic problem. The many ramifications precipitated by this crisis in the aging body threaten the patient's life and therefore command the attention of all scientific resources. This problem becomes a group responsibility with many participants, the major ones being the general practitioner, internist, anesthetist, and orthopedist.

General Practitioner.—The general physician has the initial contact with the patient. He must identify or clinically suspect the possibility of hip fracture. He must recognize the problem as one deserving emergency attention. The patient must be hospitalized as soon as possible. The general practitioner must provide the patient with relief from pain and supervise transportation of the patient so that the bone fragments are spared as much motion as possible. He must provide, too, the

important psychologic boost which is particularly necessary in the aged.

Internist.—

The internist must recognize most acutely the nature of the emergency. Procrastination with relatively complete immobilization encourages disaster due to circulatory stasis. The aged patient represents an organism scarred by past and current pathologic changes superimposed over physiologic degenerative changes. Not infrequently the patient is admitted to the hospital in a state of poor nutritional, electrolyte, and fluid balance. Other frequently encountered complications include arteriosclerotic heart disease with or without arrhythmias, incipient or overt myocardial decompensation, anemia, hypertension, diabetes mellitus, avitaminosis, hypoproteinemia, hepatic insufficiency, early renal decompensation, and senile psychosis. A thorough clinical evaluation of the patient should be accomplished as soon after admission as possible and supplemented with laboratory evaluations of the major systems. Immediate measures must be instituted for the modification or correction of any clinically evident pathologic changes.

Anemia should be corrected with preoperative transfusions. Because of the fragile state of the homeostatic mechanisms, transfusions are indicated even in mild anemia. The oxygen-carrying facilities must be maintained at maximum levels. The following index may be used: 500 cc. of whole blood for each 3 points of the hematocrit reading below 50. Any blood loss at the time of surgery should be replaced. The rate of administration is modified in accordance with the central cardiac status.

Vitamin deficiencies demand vigorous treatment. Vitamin C deficiencies are of particular interest because of oxidation-reduction properties which stimulate healing. Thiamine and, to a lesser extent, riboflavin are important in carbohydrate metabolism. Glucose infusions further deplete the reserve of these vitamins.

Simple dehydration must be treated vigorously or deficits accumulate readily. In the absence of other complications, fluid deficits can be corrected in a few days by establishing a daily intake of 40 cc. per kg. of body weight. The preferable route, of course, is oral, but frequently parenteral supplement is necessary. Urinary output of 1,000 cc. or more usually indicates satisfactory hydration.

With loss of fluids, there is invariably concomitant loss of electrolytes. The more important ones to be evaluated for replacement are sodium, potassium, and chlorides. The renal system attempts to conserve sodium in states of hyponatremia, but no such control for potassium exists in hypopotassemia. The average daily urinary output of sodium chloride is 5 to 10 grams. An output of less than 3 grams per liter is indirect evidence of hyponatremia. Potassium deficiency results from inadequate intake or excessive output of the electrolyte. Factors which significantly accentuate deficiencies are continuous gastric suction and increase in the level of corticosteroids. The increase of the latter may stem from exogenous or endogenous sources as occurs with elaboration of pituitary adrenocorticotropic hormone during such crises as surgery. Potassium must be administered carefully even if hydration and adequate renal function are satisfactory. Oral administration of potassium chloride in doses of 0.5 to 1 gram every 4 hours is preferable, but it can be given parenterally in dilutions of 3 grams or 40 mEq. per liter.

Since proteins are necessary for tissue repair and cellular replacement, an assay of their level is important. Hypoproteinemic states tend to delay healing. Oral replacement is preferable, but in critical shortages protein levels can be improved by administration of plasma which contains 60 grams of protein per liter. Average protein requirements are 1 gram per kg. of body weight, but postoperatively the need may rise to three to four times this figure. Tube feeding with the utilization of such products as Sustagen can prove of considerable assistance when the usual form of oral ingestion proves temporarily impractical.

Additional preoperative preparation may include digitalization for incipient or overt myocardial decompensation. Frequently, diabetic standardization is necessary for known long-standing or a newly precipitated diabetes mellitus. Antibiotic therapy should be always immediately instituted for prophylactic if not for actual therapeutic purposes.

Inasmuch as the patient must be immobilized by temporary external fixation upon admission, time cannot be sacrificed for thorough laboratory studies. The principal objective is to obtain maximum conditions in the shortest time. Early internal fixation permits the orthopedic problem to be readily minimized, and all efforts can then be directed toward the complicating factors without the handicap of immobilization.

Anesthetist.—

The anesthetist constitutes a very important part of this team. Success or failure frequently rests on his shoulders. The inexperienced anesthetist or one lacking a comprehensive knowledge of the delicate balance which is characteristic of aged patients certainly should not assume this responsibility. Some of the more important immediate objectives include carefully planned premedication: usually one third to one half of the average adult dosage is adequate. A satisfactorily premedicated patient invariably reduces the anesthetic hazards, but premedication can readily become excessive and often is given needlessly. Aged patients have lowered metabolic rates which contribute to a diminished ability to detoxify opiates and barbiturates.

The anesthetic agent must permit an adequate supply of oxygen. Agents which tend to potentiate or precipitate cardiac arrhythmias must be avoided as much as possible. Intravenous procaine infusions may be given to aid in reducing myocardial irritability. The modality utilized must not predispose to a precipitous fall in blood pressure. The arterial tension must be observed very carefully throughout the surgical procedure so that minor changes may be noted early and minimal quantities of pressor substances used to promote desirable changes. Late recognition of blood pressure changes sets the stage for too large dosages too late.

Anesthesia which can be used successfully includes low (saddle) subarachnoid block, unilateral paravertebral block, and local field block. Supplemental anesthetic agents which may be utilized are nitrous oxide-oxygen mixture, small doses of intravenous Demerol, and dilute solutions of thiopental sodium. A carefully administered anesthetic permits the return to bed of a stabilized patient.

Orthopedist.—The orthopedist must study the problem carefully and choose the modality which will provide secure fixation of the fragments in a reasonable time with a minimum of surgical trauma.

Results.—Through the combined efforts of this group, the risks of the fractured hip in the aged can be

minimized. Not only can the degree of morbidity be decreased, but the mortality rate can be materially reduced. Lengthy periods of hospitalization can be avoided, and the economic and social embarrassment of this crisis can be eased.

RESULTS

This review of approximately 145 cases compiled in the past 5 years at the Detroit Osteopathic Hospital reveals additional interesting findings. With very few exceptions treatment of cases in this series was conducted with the outlined philosophy. The greatest incidence of hip fracture was found to occur in the eighth decade of life. Women outnumbered men by a ratio of almost 3 to 1. The oldest patient treated successfully was 96 years of age. Sixteen patients (11 per cent) died. These deaths included six patients who were not operated on. In two, the fractures were pathologic. Two died shortly following admission. One (88 years old) had been immobilized in a cast by a general surgeon. One died on the operating table following subarachnoid block. The mortality rate among patients submitted to surgery was 6.9 per cent. These deaths were the result of vascular complications, including arteriosclerotic heart disease, cerebral thrombosis, and coronary thrombosis. There was one case of spontaneous pneumothorax due to bullous emphysema.

Further calculations revealed that the approximate percentages of patients treated successfully (according to age groups) were: 75 per cent of patients above the age of 90, 82 per cent between the ages of 80 and 90, 86 per cent between the ages of 70 and 80, and 95 per cent of patients between the ages of 60 and 70.

SUMMARY

1. Fracture of a hip in an aged person must be recognized as a relative emergency.

2. Immediate preoperative evaluation of the patient should be instituted, and he should be submitted to internal fixation within 24 to 72 hours.

3. The patient must be mobilized on the first postoperative day; he is moved from bed to chair.

4. Anesthesia must be carefully planned by a competent, well-informed, experienced physician who recognizes and provides for the unique characteristics of the aged patient.

5. External fixation methods in the aged have extremely high mortality rates and must be avoided wherever possible.

6. There are virtually no medical contraindications to internal fixation. Only circumstances which are an immediate threat to life, such as irreversible shock, are contraindications to surgery.

7. The combined team effort permits the most efficient exploitation of all scientific resources.

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Fracture Immobilization with Intramedullary Kirschner Wires and with Parham Bands

DONALD SIEHL, D.O.
Dayton, Ohio

KIRSCHNER INTRAMEDULLARY WIRES

In 1953 Dr. Bradford and I[1] reported on a series of 19 cases of fracture of the clavicle in which intramedullary Kirschner wire had been used for immobilization. We reported good results in 79 per cent. Since that time we have treated 23 additional clavicular fractures with this method and have applied Kirschner wire fixation to several other fractures as well. This report is written to present some of our experiences with the use of this method, to illustrate that cases must be selected, and to show that the disadvantages of the method must be known before using it. The patients in the second series are somewhat older than those in the original report, since we have tended not to operate on younger children. We can still report approximately the same percentage of good results, although some complications have occurred. Results in this series are presented in Table I, which includes data on both the present and the previous series. Of the total of 42 cases, results were good in 39, fair in 1, and poor in 1. There was 1 death. The average healing time was 9 weeks. Ages ranged from 4 to 88 years.

Drainage at the pin site has occurred in a number of cases, but this was never excessive, nor has it resulted in osteomyelitis. In one case the pin bent following subsequent injury, but it has given no trouble and remains in place. In two other cases the pin fractured, and in both cases the distal portion was removed and the proximal portion left in the medullary canal. In another case the pin was removed too early, resulting in some angulation at the fracture site, although subsequent healing occurred without difficulty. Healing was somewhat delayed in this case. Slightly delayed healing also occurred in two other cases.

We realize that almost all fractures of the clavicle will heal with closed methods, but we feel that this particular open method is justified because of its simplicity, because of the comfort it affords the patient, and because the patient can be returned to reasonably normal activity much more quickly.

In treating other fractures by means of Kirschner wire fixation, we have had some success and some difficulties. Another series of cases is presented for the purpose of showing the use of this method for various other types of fractures (Table II). We find that the method is rather successful in displaced metatarsal and metacarpal fractures. In our experience the retrograde method of application of the pin is by far the simplest and the best.

TABLE I—FRACTURES OF CLAVICLE FIXED BY INTRAMEDULLARY PINNING

Case	Age	Sex	Total Weeks of Healing	Final Result	Comment
1.	47	F	9	Fair	Associated fracture of scapula and ribs; considerable stiffness of shoulder
2.	13	M	7	Good	
3.	7	M	5	Good	
4.	26	F	8	Good	Some displacement occurred during healing, result good
5.	35	F	10	Good	Associated concussion of brain
6.	15	M	5	Good	
7.	88	F	8	Good	
8.	14	M	6	Good	
9.	5	M	6	Good	Associated concussion of brain
10.	58	F	8	Good	
11.	6	M	11	Good	Associated concussion of brain; considerable drainage from pin site with excess granulation tissue formation until removal of pin
12.	11	M	5	Good	Associated concussion of brain
13.	9	M	6	Good	Several stitch abscesses occurred in incision
14.	4	M		Died	Associated fracture of pelvis; death due to pulmonary embolism and thrombosis
15.	68	F	9	Good	
16.	69	M	8	Good	
17.	16	M	10	Poor	Fragments displaced; pin protruded from proximal fragment; poor result (This method should not have been used on this fracture.)
18.	5	M	9	Good	
19.	7	M	5	Good	
20.	11	F	10	Good	
21.	16	F	7, 14	Good	Fractures of both clavicles; one did well and healed normally; other was somewhat delayed in healing; pin was removed too soon and some angulation occurred, further delaying healing; final result good
22.	21	M	6	Good	Associated concussion of brain; fracture unstable, even after pinning; figure-of-eight cast also used; patient somewhat uncooperative
23.	13	M	7	Good	
24.	37	F	13	Good	Good result in spite of lack of cooperation from patient; associated head contusions
25.	12	F	9	Good	Some drainage from pin site
26.	19	M	9	Good	
27.	25	M	11	Good	Two pins used for fracture of outer end
28.	52	M	9	Good	Associated displaced fracture of hand also pinned
29.	43	F	14	Good	Comminuted fracture with removal of two loose fragments caused delayed healing; associated fractures of 7 ribs
30.	12	F	14	Good	Healing somewhat delayed for no apparent reason
31.	50	F	13	Good	Considerable drainage at pin site with excess granulation tissue; some residual stiffness and aching in shoulder for additional two months
32.	15	M	8	Good	Shortly after full activity was permitted and before pin was removed, patient suffered another injury to the shoulder resulting in a refracture and bending of the pin; subsequent healing with good result, although pin remains in place
33.	13	M	8	Good	Associated fracture of mandible which required interdental wiring
34.	16	M	9	Good	
35.	7	M	9	Good	
36.	17	M	9	Good	Good result occurred in spite of lack of cooperation from patient and development of excess callus, probably because he continued rather full use of the part
37.	39	M	10	Good	Previous acromioclavicular separation repaired by open reduction with insertion of a screw between clavicle and coracoid process; removal of this screw necessary before medullary pin could be placed; fracture of pin occurred, only one half of pin removed; breakage caused by defect in calibrated pin
38.	11	M	16	Good	Patient persisted in too much activity including boxing, bowling, et cetera; excess callus at fracture site; irritation at pin end with drainage and granulation tissue; some angulation and breakdown of callus after pin removal; final result, however, was good; recheck in 6 months showed excellent result
39.	11	M	9	Good	Several stitch abscesses; fracture of pin; pin still in place but not giving trouble
40.	16	M	18	Good	Delayed healing, probably because of too much activity; patient failed to keep appointments, delaying pin removal
41.	16	M	12	Good	
42.	64	F	9	Good	Stitch abscesses; some drainage and irritation at end of pin; associated nervous disorder requiring Thorazine therapy

TABLE II—PATIENTS TREATED BY KIRSCHNER WIRE FIXATION

Case	Date	Age	Sex	Diagnosis	Result	Comment
1.	5/5/52	67	F	Compound comminuted fracture-dislocation of right ankle	Good	Two pins for immobilization of malleoli
2.	8/1/52	11	M	Fractures of left fourth and fifth metatarsal bones	Good	Kirschner wire and plaster cast
3.	11/6/52	6	M	Supracondylar fracture of left humerus	Poor	Poor result due chiefly to beginning gangrene and Volkmann's ischemic contracture when patient was first seen; fracture itself did very well but there is resultant deformity of the forearm and hand
4.	11/11/52	5	M	Fracture of lateral condyle of left humerus	Good	Three wires and plaster splint needed to anchor condyle
5.	4/15/53	5	F	Fracture-dislocation of phalanx of left ring finger with malunion	Good	
6.	6/20/53	3½	M	Supracondylar fracture of right humerus	Good	Kirschner wire and splint
7.	6/22/53	8	M	Malunion of fractured lateral condyle of left humerus	Good	Malunion corrected and fragment immobilized with two wires and splint
8.	7/29/53	8	M	Supracondylar fracture of left humerus	Good	Two wires and splint
9.	8/10/53	4	M	Compound fracture of proximal phalanx of right thumb	Good	Associated with severed extensor pollicis tendon
10.	9/3/53	38	F	Fracture of left fifth metacarpal bone	Good	
11.	9/24/53	3	M	Fracture of lower end of left humerus	Good	Kirschner wire and splint
12.	11/10/53	25	F	Fracture of right fifth metatarsal bone	Fair	Considerable soreness in area after healing; intramedullary wire plus circular wire; wires later removed elsewhere
13.	12/12/53	8	M	Severe compound dislocation and tendon injury to base of left small finger	Good	Medullary wire for immobilization of fracture-dislocation and for immobilization pending tendon healing
14.	2/2/54	42	M	Multiple compound comminuted fractures of all left metatarsal bones	Good	Skeletal toe traction used first elsewhere without results; intramedullary Kirschner wires used with good results
15.	2/25/54	42	M	Nonunion of right second metacarpal bone	Good	
16.	4/13/54	3	M	Comminuted fractures of both humeri	Good	Severe displacement; immobilization presented problem; intramedullary wires used along with screw and double shoulder spica cast
17.	4/19/54	17	M	Fractures of left second, third, fourth, and fifth metatarsals	Good	Four intramedullary Kirschner wires
18.	5/24/54	52	M	Comminuted fracture of right fifth metacarpal bone	Good	Associated with fracture of clavicle which was pinned
19.	7/7/54	6	M	Supracondylar fracture of left humerus	Good	Two Kirschner wires and splint; patient developed hematogenous joint infection in same elbow about 8 months later which responded to antibiotics
20.	7/16/54	9	M	Fracture of upper end of left humerus	Good	Two Kirschner wires and spica cast
21.	7/28/54	9	M	Fracture of lower end of left radius and ulna	Good	Three medullary Kirschner wires and cast
22.	7/30/54	10	M	Fracture of right radius and ulna	Good	Two medullary Kirschner wires
23.	9/23/54	8	F	Fracture of proximal end of right radius	Fair	Some drainage while pin was in, which continued for about 10 weeks after pin removal and healing of fracture; no evidence of osteomylitis on x-ray (This was definitely a wound infection and, in our opinion, resulting inflammation caused some stiffness of the joint which is only slowly improving.)
24.	10/9/54	9	F	Fracture of proximal right radius	Good	Kirschner wire fixation across epiphyseal line; practically same as previous case, but without infection
25.	10/9/54	31	M	Fracture of right fourth and fifth metacarpal bones	Good	Two medullary Kirschner wires and splint
26.	2/1/55	9	F	Fracture-dislocation of epicondylar epiphysis of right humerus	Good	Epicondylar epiphysis anchored with two Kirschner wires
27.	2/21/55	20	M	Fracture of right fourth metacarpal bone	Good	
28.	1/14/55	55	F	Fracture of left radius and ulna with malunion	Fair	Developed Sudeck's acute atrophy with considerable residual stiffness of hand and fingers which responded only slowly; fracture healed satisfactorily with actual minimal deformity; two large Steinmann pins used

We feel that intramedullary fixation is indicated in some displaced fractures of the condylar epiphyses and some displaced supracondylar fractures of the humerus. We have used it for several fractures involving displacement of the epiphysis of the head of the radius. We have also used it for 2 fractures involving the upper shaft of the humerus and on several fractures involving the lower shafts of the radius and ulna, in which there was gross displacement requiring open reduction, and insufficient space between the fracture and the epiphysis to use a bone plate. We have found that it possibly gives a more satisfactory result than the use of the bone plate in this type of fracture. The method will work well in certain fractures of the fingers, especially those with malunion which has to be corrected.

This method has been used by us on 42 fractures of the clavicle and on 28 other fractures during the past 4 years. During this period we have treated approximately 2,000 fractures. This will indicate that we use this particular method relatively infrequently except on fractures of the clavicle where it is used in approximately 50 per cent of patients over the age of 10 years.

In commenting on the use of this method of fixation of fractures, Key[2] makes two very good observations:

> Can the fragments be immobilized more efficiently with such a nail than with some other form of internal fixation which may be applied with less difficulty and with which the dangers of complications are less? . . . The method is a valuable addition to our armamentarium but is not one which is to be used routinely or casually by the surgeon who treats only an occasional fracture. In deciding to use a medullary nail the surgeon should be conscious of the complications which may develop and be prepared to meet them.

Several articles[3-6] have appeared in recent literature in connection with Kirschner wire fixation of fractures. We agree with all of them in being somewhat enthusiastic about the method, yet we feel the need of cautioning about the disadvantages and complications. The method should not be used unless the surgeon can visualize exactly what he is doing, no matter whether the blind pinning method or the retrograde method is used. The limitations of the method must be realized and the possible complications considered. The chief complications are infection and drainage, which may persist for months, even after pin removal. We definitely feel that in expert hands this method can be used to advantage with better end-results and quicker return to normal function than with other methods. However, good surgical judgment and discretion must be utilized.

PARHAM BANDS

Because of the considerable discussion which has been evoked at previous meetings of the American Osteopathic Academy of Orthopedics by the presentation of several cases in which Parham bands have been used in the treatment of fractures, I thought it would be interesting to present our experiences with the use of this device over the past 5 years. This type of stainless steel band was originally devised for use in oblique fractures of the shafts of long bones by F. W. Parham about 1918, and a number of cases in which the band was used were reported during the following few years.[7,8] The disadvantages, deficiencies, and advantages of the method were discussed. During the intervening years this fixation device has been used somewhat sparingly by orthopedic surgeons. Dr. W. G. Bradford and I feel that if the device is used properly, and with the idea that it will eventually be removed, there are occasionally definite indications for its use, but I emphasize that we do not use the device frequently.

During the past 5 years we have used Parham bands in 10 cases. We present each of these cases briefly.

Case 1. The patient, a female, aged 55 years, was first seen April 25, 1950, with an oblique fracture of the left humerus. Open reduction was performed and two Parham bands and a shoulder spica cast were used for immobilization. At recheck examination 1 month later there was considerable angulation, but apposition was still good. At recheck examination on June 6 nonunion appeared to be starting. Angulation and displacement were severe. The bands were loose. The bands were removed at this time and a bone plate was applied. Later follow-up showed that definite nonunion occurred in spite of the bone plate. Further follow-up of the case was under another surgeon's management; a bone graft was later performed and union followed. The surgeon reports that the patient now has good use of the arm and the fracture is well healed. We would have to consider this, however, a poor result with the use of Parham bands.

Case 2. This female, aged 50 years, was first seen December 10, 1950, with a fracture of the right humerus. A Parham band and a bone plate were used at open reduction, and a shoulder spica was also applied. The patient progressed satisfactorily, and healing was complete on April 23, which is considered average time for healing. At later checkups there was no sign of irritation around the Parham band, and bone absorption was not noted. A follow-up examination in 1955 indicated that this patient still had had no trouble with the arm. The result in this case is considered good.

Case 3. A 62-year-old female with a fracture of the right femur was first seen February 16, 1951. The fracture was immobilized with an intramedullary nail and two Parham bands. Union progressed satisfactorily. There was no indication of bone absorption around the bands, and the result was good. The last follow-up on May 5, 1951, showed healing was satisfactory; the patient was ambulatory. We heard indirectly that the intramedullary nail was removed at a later date. A report dated October 18, 1955, stated that the patient walks without noticeable limp, disclaims discomfort, and performs all household duties.

Case 4. A female 35 years of age with a fractured left femur was examined on June 5, 1951. Two Parham bands were used for immobilization at open reduction. This case was complicated by a pathologic condition of the right hip joint. By April 24, 1952, the fracture had healed satisfactorily and the patient was able to begin ambulation. A follow-up examination in 1955 showed that the patient is doing very well. There was no indication of absorption around the Parham bands, and ambulation is practically normal. This would be considered a good result.

Case 5. A 65-year-old male was first seen on January 2, 1953. The diagnosis was comminuted fracture of the shaft of the left femur. Immobilization was obtained with an intramedullary nail and two Parham bands. The patient's condition was satisfactory at hospital discharge, but there was no follow-up.

Case 6. This male patient, aged 52, was first seen May 2, 1953. There was an intertrochanteric and subtrochanteric fracture of the right femur involving the upper third of the shaft. Open reduction and immobilization with two Parham bands, two bone screws,

and a hip spica cast were performed. Progress was satisfactory, and the patient was ambulatory in 4 months. There was no indication of bone absorption around the screws or bands. Result was considered good.

Case 7. This patient, a 48-year-old female, was examined on June 19, 1953, and found to have a fractured shaft of the left humerus. The fracture was first immobilized with two oblique bone screws, but a fracture occurred through the screw hole following surgery, apparently while the patient was being moved back to her room. A second operation was performed and an intramedullary nail and a Parham band were applied along with a shoulder spica cast. Union was slow but finally did take place. There was some bone absorption around the Parham band, but it was left in place. Aftercare was complicated by radial nerve palsy from which there was full recovery. The patient has been advised that the Parham band should probably be removed sometime in the future.

Case 8. A female, aged 10, was examined first on February 1, 1954. Diagnosis was comminuted fracture of the lower third of the femur. The fracture was reduced on a fracture table by means of Steinmann pin traction, and it was maintained with three Parham bands and a hip spica cast. After 6 weeks the Parham bands were removed. The patient was ambulatory within 12 weeks. An excellent result ensued.

Case 9. This patient, a female 21 years of age, was first seen May 6, 1954. There was a displaced fracture of the right humerus. Open reduction was performed, and two Parham bands were used for fixation. Healing was slow, with some irritation around the bands and bone absorption. The area was tender. We consider this a good result even though healing was delayed. The patient was advised that the bands should be removed, but so far this has not been done.

Case 10. A 28-year-old female was first seen October 30, 1954. The right humerus was fractured. Open reduction was performed, and fixation was maintained with two Parham bands and a spica cast. Healing was somewhat delayed, possibly owing to the accurate reposition of the fracture fragments. There was no extracortical callus, but there was some absorption at the site of the bands. This case was complicated by radial nerve palsy from which the patient completely recovered. The bands are to be removed in the near future.

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American Osteopathic Association
Sixtieth Annual Convention
Hotel Statler
New York — July 16-20, 1956

COMMITTEE ON PROGRAM

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Convention Teaching Sessions

MONDAY, JULY 16

Morning Session
Grand Ballroom, Hotel Statler

8:00 A.M.

Visual Education Film: Symposium on Vascular Head Pain

Moderator: Derek Denny-Brown, M.D. Panel: Derek Denny-Brown, M.D., Bayard T. Horton, M.D., Arnold P. Friedman, M.D., Bertram Selverstone, M.D., and John R. Graham, M.D. 43 minutes—sound: Distributed by Organon, Inc., Orange, N.J.

9:00 A.M.

Call to order

HOBERT C. MOORE, D.O., Bay City, Mich.
PRESIDENT, AMERICAN OSTEOPATHIC ASSOCIATION

Invocation

Introduction of Program Chairman

HOBERT C. MOORE, D.O., Bay City, Mich.
PRESIDENT, AMERICAN OSTEOPATHIC ASSOCIATION

9:30 A.M.

Developmental Problems Arising from Somatic Structures

ANGUS G. CATHIE, D.O., Philadelphia

10:00 A.M.

The Food, Drug, and Cosmetic Act and the Physician

HONORABLE GEORGE P. LARRICK, Washington, D.C.
COMMISSIONER OF FOOD AND DRUGS
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Mr. Larrick joined the Food and Drug Administration as an Inspector in 1923. He served successively as Administrative Assistant, Senior Inspector, Chief Inspector, Assistant Commissioner, and Associate Commissioner prior to his appointment in 1954 as the Commissioner.

11:00 A.M.

Keynote Address—The Somatic Components of Disease

R. N. MacBAIN, D.Sc., D.O., Chicago
PRESIDENT, CHICAGO COLLEGE OF OSTEOPATHY

Dr. MacBain is a graduate of the Chicago College of Osteopathy. He is the President of the Chicago College of Osteopathy and is the President of the American Association of Osteopathic Colleges.

12:00 Noon Recess

MONDAY, JULY 16

Afternoon Session A
Grand Ballroom, Hotel Statler

Symposium: The Management of Headache

Moderator: KARL L. ALBAECK, A.B., M.S., D.O., Burbank, Calif.

2:00 P.M.

Neuroanatomy and Neurophysiology of Head Pain

KARL L. ALBAECK, A.B., M.S., D.O., Burbank, Calif.

Dr. Albaeck, a graduate of the College of Osteopathic Physicians and Surgeons, is certified in Neurosurgery. He is Senior Neurologist and Neurosurgeon at the Los Angeles County Osteopathic Hospital, Associate Professor in Neurology and Anatomy and Lecturer in Neurophysiology at the College of Osteopathic Physicians and Surgeons, and Lecturer in Neurosurgery at the Graduate School of the College of Osteopathic Physicians and Surgeons.

2:20 P.M.

Discussion Period

Members of panel:

JOSEPH H. WYATT, D.O., Highland Park, Mich.

Dr. Wyatt is a graduate of the Kirksville College of Osteopathy and Surgery. He is Chairman of the Department of Eye, Ear, Nose, and Throat at Detroit Osteopathic Hospital and Assistant Clinical Professor of Surgery at the Chicago College of Osteopathy.

HAROLD E. HIGLEY, D.O., Des Moines, Iowa

Dr. Higley is a graduate of the Kirksville College of Osteopathy and Surgery. He is Chairman of the Department of Psychiatry at the Des Moines Still College of Osteopathy and Surgery and a member of the Staff of the Still Osteopathic Hospital.

PHILIP B. DAVIS, B.A., M.A., D.O., Burbank, Calif.

Dr. Davis, a graduate of the College of Osteopathic Physicians and Surgeons, is certified in Neurosurgery and is a Fellow of the American College of Neuropsychiatrists. He is Senior Attending Physician, Department of Neurosurgery at Los Angeles County Osteopathic Hospital, and Assistant Professor in Neuropathology and Clinical Neurology at the College of Osteopathic Physicians and Surgeons.

STANLEY J. TURNER, D.O., Highland Park, Mich.

2:20 P.M. Discussion

3:30 P.M. Question and Answer Period

5:00 P.M. Adjournment

MONDAY, JULY 16

Afternoon Session B
Keystone Room, Hotel Statler

Symposium: The Treatment of Emergencies

Introduction: RICHARD O. BRENNAN, D.O., Houston, Tex.

Moderator: LOWELL M. HARDY, D.O., Portland, Me.

2:00 P.M.

Principles of Emergency Management of Shock

LOWELL M. HARDY, D.O., Portland, Me.

Dr. Hardy, a graduate of the Kirksville College of Osteopathy and Surgery, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Chief of the Department of Internal Medicine at the Osteopathic Hospital of Maine.

2:20 P.M.

Respiratory Emergencies

J. ERNEST LEUZINGER, D.O., Philadelphia

2:40 P.M.

Emergency Treatment of Burns

JOSEPH T. ROGERS, D.O., Wyandotte, Mich.

3:00 P.M.

Surgical Trauma

W. DONALD BAKER, D.O., Los Angeles

Dr. Baker, a graduate of the College of Osteopathic Physicians and Surgeons, is certified in Surgery and is a Fellow of the American College of Osteopathic Surgeons. He is a member of the Staff of all osteopathic hospitals in the State of California and is a Consultant in Cardiovascular Disease at these hospitals.

JOHN P. WOOD, B.S., D.O., Birmingham, Mich.

Dr. Wood, a graduate of the Kirksville College of Osteopathy and Surgery, is certified in Orthopedic Surgery. He is Senior Attending Surgeon of the Department of Orthopedics at the Detroit Osteopathic Hospital and Consulting Orthopedic Surgeon at the Flint Osteopathic Hospital.

DONALD M. DONISTHORPE, D.O., Los Angeles

4:00 P.M. Question and Answer Period

5:00 P.M. Adjournment

TUESDAY, JULY 17

Morning Session
Grand Ballroom, Hotel Statler

8:00 A.M.

Visual Education Film: Therapy Influencing the Autonomic Nervous System

A review of the anatomy and physiology of the autonomic nervous system and essential pharmacology of representative drugs which act on this system. 19 minutes—sound—color: Distributed by G. D. Searle & Company, Chicago.

9:00 A.M.

Origins and Manifestations of Local Vasomotor Disturbances and Their Clinical Significance

HARRY M. WRIGHT, D.O., Kirksville, Mo.

Dr. Wright is a graduate of the Kirksville College of Osteopathy and Surgery. He is a member of the New York Academy of Science, the American Association for the Advancement of Science, and the American Association of University Professors.

9:45 A.M.

Neurovascular Factors in Disease

PRICE E. THOMAS, B.S., D.O., Kirksville, Mo.

Dr. Thomas, a graduate of the Kirksville College of Osteopathy and Surgery, is a member of the teaching staff of that institution. He is a member of the New York Academy of Science and the American Association of University Professors.

10:30 A.M.

Certain Clinical Aspects of the Facilitation Syndrome

J. S. DENSLOW, D.Sc., D.O., Kirksville, Mo.

Dr. Denslow, a graduate of the Kirksville College of Osteopathy and Surgery, is a member of the staff

of the Kirksville Osteopathic Hospital. He is Secretary of the American Association of Osteopathic Colleges and a member of the American Association for the Advancement of Science, the American Physiological Society, and the New York Academy of Science.

11:15 A.M.

Osteopathic Research: Why, What, and Whither

IRWIN M. KORR, B.A., M.A., Ph.D., Kirksville, Mo.

Dr. Korr is Professor of Physiology and Chairman of the Division of Physiological Sciences at Kirksville College of Osteopathy and Surgery. He is a member of the American Association for the Advancement of Science, the American Physiological Society, and the Society for Experimental Biology and Medicine, and is an Associate Member of the American Osteopathic Association.

12:00 Noon Recess

TUESDAY, JULY 17

Afternoon Session A
Grand Ballroom, Hotel Statler

Symposium: The Mechanisms of Chest Pain

Moderator: WILLIAM F. DAIBER, D.O., Philadelphia

2:00 P.M.

The Mechanisms of Chest Pain

WILLIAM F. DAIBER, D.O., Philadelphia

Dr. Daiber, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Chairman of the Department of Osteopathic Medicine and Professor of the Osteopathic Cardiovascular Program at the Philadelphia College of Osteopathy and its hospitals.

2:20 P.M.

Discussion Period

Members of Panel:

NEIL R. KITCHEN, D.O., Detroit

Dr. Kitchen, a graduate of the Des Moines Still College of Osteopathy and Surgery, is certified in Internal Medicine. He is a Senior Member of the Department of Internal Medicine of the Detroit Osteopathic Hospital and is Program Chairman for the 1957 Annual Convention of the American Osteopathic Association.

WILLIAM D. LONG, D.O., Los Angeles

Dr. Long, a graduate of the College of Osteopathic Physicians and Surgeons, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is the Senior Attending Physician at the Los Angeles County Osteopathic Hospital, Chairman of the Department of Medicine at the Graduate School of the College of Osteopathic Physicians and Surgeons, Chairman of the Department of Medicine at Burbank Hospital, and Associate Professor of Medicine at the College of Osteopathic Physicians and Surgeons.

GEORGE H. GUEST, D.O., Philadelphia

Dr. Guest is a graduate of the Philadelphia College of Osteopathy. He is a staff member of the Hospitals of the Philadelphia College of Osteopathy and Associate Medical Director of Roseneath Farms.

2:20 P.M. Discussion

3:30 P.M. Question and Answer Period

5:00 P.M. Adjournment

TUESDAY, JULY 17

Afternoon Session B
Keystone Room, Hotel Statler

Symposium: Sterility and Infertility

Introduction: RICHARD O. BRENNAN, D.O., Houston, Tex.

Moderator: JAMES G. MATTHEWS, JR., B.S., D.O., Highland Park, Mich.

2:00 P.M.

Sterility and Infertility

JAMES G. MATTHEWS, JR., B.S., D.O., Highland Park, Mich.

Dr. Matthews, a graduate of Kirksville College of Osteopathy and Surgery, is certified in Obstetrics and Gynecology and is a Fellow of the American College of Obstetricians and Gynecologists. He is Chairman of the Department of Obstetrics and Gynecology at Detroit Osteopathic Hospital and a member of the Staff of Art Centre Hospital.

2:20 P.M.

Discussion Period

Members of Panel:

FLOYD E. DUNN, D.O., Kansas City, Mo.

Dr. Dunn, a graduate of the Philadelphia College of Osteopathy, is certified in Neurology and Psychiatry and is a Fellow of the American College of Neuropsychiatrists. He is a member of the staff of the Hospitals of the Kansas City College of Osteopathy and Surgery and of the Visiting Staff of Lakeside Hospital. Dr. Dunn holds memberships in the American Association for the Advancement of Science and the American Association on Mental Deficiency.

JOHN A. FETZER, D.O., Highland Park, Mich.

Dr. Fetzer, a graduate of the Kirksville College of Osteopathy and Surgery, is certified in Surgery. He is Senior Surgeon at the Detroit Osteopathic Hospital.

ALLEN B. CORBETT, D.O., Flint, Mich.

Dr. Corbett, a graduate of the Kirksville College of Osteopathy and Surgery, is Chairman of the Department of Obstetrics and Gynecology at Flint Osteopathic Hospital. He is a Senior Member of the

American College of Osteopathic Obstetricians and Gynecologists.

MILTON McKAY, A.B., A.D., Chicago

Mr. McKay is Legal Counsel for the American Osteopathic Association. He is a member of the Chicago Bar Association and the American Bar Association.

2:20 P.M. Discussion

3:30 P.M. Question and Answer Period

5:00 P.M. Adjournment

WEDNESDAY, JULY 18

Morning Session
Grand Ballroom, Hotel Statler

8:00 A.M.

Visual Education Film: Special Problems in the Management of Peptic Ulcer

Presents solutions to difficult diagnostic and therapeutic ulcer conditions. 40 minutes—sound—color: Distributed by Wyeth Inc., Philadelphia.

9:00 A.M.

Electromyography

JOHN M. ANDREWS, D.O., Los Angeles

Dr. Andrews, a graduate of the College of Osteopathic Physicians and Surgeons, is certified in Physical Medicine and Rehabilitation. He is Professor and Executive Senior of the Department of Physical Medicine and Rehabilitation at the Los Angeles County Osteopathic Hospital and Director of the Rehabilitation Center at the College of Osteopathic Physicians and Surgeons.

9:20 A.M.

Cardiovascular Disease: Research and Training

PAUL DUDLEY WHITE, A.B., M.D., Boston

Dr. White, a graduate of Harvard Medical School, is Executive Director of the National Advisory Heart Council, United States Public Health Service. He is President of the International Society of Cardiology, and a member of the American Board of Internal Medicine and of the American Heart Association. Dr. White is Consultant at the Massachusetts General Hospital.

10:05 A.M.

The Department of Health, Education, and Welfare's Role in Public Health

HONORABLE BRADSHAW MINTENER, Washington, D.C.

ASSISTANT SECRETARY OF UNITED STATES DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Mr. Mintener is a graduate of the University of Minnesota and a Past President of Pillsbury Mills, Inc. He has served as Associate Trustee of Hamline University, as a member of the Minneapolis Citizens Charter Committee, as Chairman of the Health and Welfare Commission of the Twin Cities Ladies Garment Industry, and as Chairman of the Minnesota Little Hoover Commission.

11:05 A.M.

Andrew T. Still Memorial Lecture: Man, A Challenge to Osteopathy, Yesterday, Today, and Tomorrow

PAUL VAN B. ALLEN, A.B., D.O., Indianapolis

Dr. Allen, a graduate of the Chicago College of Osteopathy, was elected by the Board of Trustees of the Association as the Lecturer for the A. T. Still Memorial Address for the Sixtieth Annual Convention. Dr. Allen is Secretary-Treasurer of the National Board of Examiners for Osteopathic Physicians and Surgeons and a member of the Board of Trustees of the Chicago College of Osteopathy, the American Public Health Association, and the Indiana Public Health Association.

12:00 Noon Recess

WEDNESDAY, JULY 18

Afternoon Session A
Grand Ballroom, Hotel Statler

Symposium: The Clinical Approach to Abdominal Pain

Moderator: WARD E. PERRIN, B.S., D.O., Chicago

2:00 P.M.

The Mechanism of Pain in the Abdomen

WARD E. PERRIN, B.S., D.O., Chicago

Dr. Perrin, a graduate of the Chicago College of Osteopathy, is certified in Internal Medicine. He is a member of the Panel for Evaluation of Therapeutics and Medical Agents of the American Osteopathic Association. He is a staff member of the Chicago Osteopathic Hospital.

2:20 P.M.

Discussion Period

Members of Panel:

EDWARD P. SMALL, JR., B.S., D.O., Detroit

Dr. Small, a graduate of the Chicago College of Osteopathy, is certified in Roentgenology. He is Associate Roentgenologist at the Detroit Osteopathic Hospital.

J. MILTON ZIMMERMAN, D.O., Dayton, Ohio

Dr. Zimmerman, a graduate of the Des Moines Still College of Osteopathy and Surgery, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Chairman of the Department of Internal Medicine at Grandview Hospital.

J. NATCHER STEWART, D.O., Dallas, Tex.

Dr. Stewart, a graduate of the Kirksville College of Osteopathy and Surgery, is certified in Surgery. He is Chairman of the Department of Surgery at Stevens Park Osteopathic Hospital.

EDWARD G. DREW, D.Sc., D.O., China, Me.

Dr. Drew, a graduate of the Philadelphia College of Osteopathy, is certified in Surgery and is a Fellow of the American College of Osteopathic Surgeons. He is Chief of Staff at the Waterville Osteopathic Hospital and Professor Emeritus of

Gynecology at the Philadelphia College of Osteopathy.

2:20 P.M. Discussion

3:30 P.M. Question and Answer Period

5:00 P.M. Adjournment

WEDNESDAY, JULY 18

Afternoon Session B
Keystone Room, Hotel Statler

Symposium: The Cutaneous Manifestations of Internal Disease

Introduction: RICHARD O. BRENNAN, D.O., Houston, Tex.

Moderator: A. P. ULBRICH, B.S., D.O., Detroit

2:00 P.M.

The Skin as a Diagnostic Aid

A. P. ULBRICH, B.S., D.O., Detroit

Dr. Ulbrich, a graduate of the Philadelphia College of Osteopathy, is certified in Dermatology. He is a staff member at Art Centre Hospital and at Detroit Osteopathic Hospital. He is Associate Professor of Dermatology at the Chicago College of Osteopathy.

2:20 P.M.

Discussion Period

Members of Panel:

MORTON TERRY, B.A., M.S., D.O., Miami, Fla.

Dr. Terry, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine. He is Chief of the Department of Internal Medicine at Biscayne Osteopathic Hospital and at Magnolia Hospital and is Consultant in Medicine at several other hospitals in the Miami area.

HAROLD BRUNER, D.O., Philadelphia

Dr. Bruner, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Attending Allergist at Hospitals of Philadelphia College of Osteopathy and North Center Hospital and is Associate Professor of Allergy at Philadelphia College of Osteopathy.

EDWIN H. CRESSMAN, D.O., Philadelphia

Dr. Cressman, a graduate of the Philadelphia College of Osteopathy, is certified in Dermatology and Syphilology. He is Professor and Head of the Department of Dermatology at the Philadelphia College of Osteopathy and Attending Dermatologist at the Hospitals of the Philadelphia College of Osteopathy.

F. MUNRO PURSE, D.O., Narberth, Pa.

Dr. Purse, a graduate of the Philadelphia College of Osteopathy, is certified in Pediatrics. He is Associate Professor in the Department of Pediatrics and Attending Pediatrist at the Philadelphia College of Osteopathy and its hospitals.

2:20 P.M. Discussion

3:30 P.M. Question and Answer Period

5:00 P.M. Adjournment

WEDNESDAY, JULY 18

Technic Seminars

2:00-5:00 P.M.

Room Assignments at Hotel Statler

Agenda:
1. Principles
   a. Anatomy
   b. Physiology as Related to the Lesion
   c. Pathology
2. Diagnosis
   a. Palpation
   b. Tests of Motion
3. Treatment
   a. From the View of the Physician
   b. From the Patient's View
   c. Technics Applicable
   d. Treatment of the Patient with the Problem
4. Technic Demonstration
   a. Group and Individual Participation
   b. Criticism of Ideas and Methods

Seminar I:

The Direct and Indirect Technic of Acute Low Back Problems

VINCENT NILS HAMMERSTEN, D.O., Newton Highlands, Mass.

Dr. Hammersten is a graduate of the Kirksville College of Osteopathy and Surgery. He is Secretary-Treasurer of the New England Academy of Applied Osteopathy and is a member of the American Osteopathic College of Geriatrics.

Seminar II:

Posture and its Relation to Systemic Diseases

C. RAYMOND NELSON, D.O., San Antonio, Tex.

Dr. Nelson is a graduate of the Chicago College of Osteopathy. He is President of the Academy of Applied Osteopathy.

Seminar III:

Headache

HOWARD A. LIPPINCOTT, D.O., Moorestown, N.J.

Dr. Lippincott is a graduate of the American School of Osteopathy. He is a member of the Academy of Applied Osteopathy.

Seminar IV:

Low Back Problems—Diagnosis and Management

MARTIN C. BEILKE, D.O., Chicago

Seminar V:

Low Back Problems

C. GORHAM BECKWITH, D.O., Hudson, N.Y.

Dr. Beckwith is a graduate of the Chicago College of Osteopathy. He is a Fellow of the New York Academy of Osteopathy and is a member of the Academy of Applied Osteopathy.

Seminar VI:

Cervical Spine

DAVID HEILIG, B.A., D.O., Drexel Hill, Pa.

Dr. Heilig is a graduate of the Philadelphia College of Osteopathy. He is Clinical Professor of Osteopathic Principles and Technics at the Philadelphia College of Osteopathy.

Seminar VII:

Acute Upper Respiratory Infections

GEORGE W. NORTHUP, D.O., Livingston, N.J.

Dr. Northup is a graduate of the Philadelphia College of Osteopathy. He is a member of the Bureau of Professional Education and Colleges and of the Board of Trustees of the American Osteopathic Association.

Seminar VIII:

The Viscerosomatic Musculoskeletal Lesion—Identification of the Somatic Component

R. McFARLANE TILLEY, D.O., Kirksville, Mo.

Dr. Tilley is a graduate of the Philadelphia College of Osteopathy. He is Chairman of the Division of Practice of Osteopathic Medicine at the Kirksville College of Osteopathy and Surgery.

Seminar IX:

Osteopathic Therapy in Cardiac Conditions

PERRIN T. WILSON, D.O., Cambridge, Mass.

Dr. Wilson is a graduate of the American School of Osteopathy, Kirksville, Mo. He is a Trustee of the Massachusetts Osteopathic Hospital and for many years was head of the clinic of that institution.

9:50 A.M.

Special Roentgen Technics in Structural Diagnosis

C. D. OGILVIE, D.O., Dallas, Tex.

Dr. Ogilvie, a graduate of the Kirksville College of Osteopathy and Surgery, is certified in Diagnostic Roentgenology. He is Chairman of the Department of Radiology at Stevens Park Osteopathic Hospital.

10:35 A.M.

Orthopedic Tests in Back Pain

CHARLES M. HAWES, D.O., Dallas, Tex.

Dr. Hawes, a graduate of the Kirksville College of Osteopathy, is a staff member of the Surgical Departments of the Dallas Osteopathic Hospital and the Fort Worth Osteopathic Hospital.

10:55 A.M.

Studies in Motion (X-ray Motion Pictures)

GEORGE H. RAMSAY, M.D., Rochester, N.Y.

Dr. Ramsay, a graduate of McGill University, is certified in Radiology. He is professor of Radiology at the University of Rochester and is a member of the Radiological Society of North America, the College of Radiology, and the British Institute of Radiology.

RAYMOND GRAMIAK, M.D., Rochester, N.Y.

12:00 Noon Recess

THURSDAY, JULY 19

Morning Session
Grand Ballroom, Hotel Statler

8:00 A.M.

Visual Education Film: Symposium on Corticotropin Therapy

Moderator: Philip S. Hench, M.D.; Panel: Peter H. Forsham, M.D., John C. Laidlaw, M.D., Heinrich G. Brugsch, M.D., Harry E. Banghart, M.D., and Bram Rose, M.D. 30 minutes—sound: Distributed by Organon, Inc., Orange, N.J.

9:00 A.M.

Recent Advances in the Treatment of Neurological Disorders

JOHN C. BUTTON, JR., B.Sc., D.O., Orange, N.J.

Dr. Button, a graduate of Kirksville College of Osteopathy, is certified in Neurology. He is Neurologist at North Jersey Osteopathic General Hospital and Consultant in Neurology at Memorial Osteopathic Hospital, Elizabeth, N.J.

9:30 A.M.

ACTH, Cortisone and Related Steroids in Clinical Medicine

RICHARD A. SCHAUB, D.O., Pasadena, Calif.

Dr. Schaub, a graduate of the College of Osteopathic Physicians and Surgeons, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Senior in Medicine and Chief of Arthritic Service at the Los Angeles County Osteopathic Hospital, Chairman of the Board of Directors of the Altadena Community Hospital, and Associate Professor in General Medicine at the College of Osteopathic Physicians and Surgeons.

THURSDAY, JULY 19

Afternoon Session A
Grand Ballroom, Hotel Statler

Symposium: The Management of Back Pain

Moderator: DONALD SIEHL, B.A., D.O., Dayton, Ohio

2:00 P.M.

The Mechanism of Back Pain

DONALD SIEHL, B.A., D.O., Dayton, Ohio

Dr. Siehl, a graduate of the Kirksville College of Osteopathy and Surgery, is certified in Orthopedic Surgery. He is a member of the staff of the Grandview Hospital.

2:20 P.M.

Discussion Period

Members of Panel:

JAMES M. EATON, M.Sc., D.O., Philadelphia

Dr. Eaton, a graduate of the Philadelphia College of Osteopathy, is certified in Orthopedic Surgery and is a Fellow of the American College of Osteopathic Surgeons. He is Professor of Orthopedic Surgery and Chairman of the Department of Surgery of the Philadelphia College of Osteopathy and its hospitals and Chairman of the American Osteopathic Board of Surgery.

K. GROSVENOR BAILEY, A.B., D.O., Los Angeles

Dr. Bailey, a graduate of the College of Osteopathic Physicians and Surgeons, is certified in Neurosurgery. He is a Fellow of the American College of Osteopathic Surgeons and is a Fellow of the American College of Neuropsychiatrists. He is Alienist to the Superior Court of Los Angeles, Executive in the Department of Neurology at the College of Osteopathic Physicians and Surgeons, and Chief of

the Department of Neurology and Neurosurgery at the Los Angeles County Osteopathic Hospital.

ROBERT B. THOMAS, D.O., Huntington, W.Va.

Dr. Thomas, a graduate of the Kirksville College of Osteopathy and Surgery, is certified in Physical Medicine and Rehabilitation. He is Chairman of the Bureau of Professional Education and Colleges of the American Osteopathic Association.

PAUL E. KIMBERLY, D.O., St. Petersburg, Fla.

Dr. Kimberly is a graduate of the Des Moines Still College of Osteopathy and Surgery. He is a member of the Academy of Applied Osteopathy and the Osteopathic Cranial Association.

D. LEONARD VIGDERMAN, D.O., New York

Dr. Vigderman, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine. He is Chairman of the Department of Internal Medicine at LeRoy Hospital and is a member of the New York Heart Association.

2:20 P.M. Discussion

3:30 P.M. Question and Answer Period

5:00 P.M. Adjournment

THURSDAY, JULY 19

Afternoon Session B
Keystone Room, Hotel Statler

Symposium: Antibiotic Therapy

Introduction: RICHARD O. BRENNAN, D.O., Houston, Tex.

Moderator: WILLIAM BALDWIN, B.A., D.O., Philadelphia

2:00 P.M.

Antibiotics and Their Properties

WILLIAM BALDWIN, B.A., D.O., Philadelphia

Dr. Baldwin, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Chairman of the Committee on Accrediation of Postgraduate Training of the American Osteopathic Association and a member of the Association's Panel for Evaluation of Therapeutics and Medical Agents. He is Chairman of the Department of Physiology and Pharmacology of Philadelphia College of Osteopathy.

2:20 P.M.

The Selection of an Antibiotic

CLAUDE A. VAN ANDEL, D.O., Muskegon, Mich.

Dr. Van Andel, a graduate of the Chicago College of Osteopathy, is Chairman of the Department of Internal Medicine at the Muskegon Osteopathic Hospital and is a member of the Board of Trustees of that institution.

2:40 P.M.

Drug Reactions

GEORGE ESSELMAN, D.O., Dayton, Ohio

3:30 P.M.

Current Treatment of Tuberculosis
(Speaker to be announced)

3:20 P.M. Discussion

4:00 P.M. Question and Answer Period

5:00 P.M. Adjournment

FRIDAY, JULY 20

Morning Session
Grand Ballroom, Hotel Statler

8:00 A.M.

Visual Education Film: Intra-Articular Injections of Hydrocortisone.

Presents technic of intra-articular injection into various joints and expectable results. 30 minutes—sound—color: Distributed by Sharp & Dohme, West Point, Pa.

9:00 A.M.

Cerebral Vascular Injuries

CLAYTON H. MORGAN, D.O., Kansas City, Mo.

Dr. Morgan is a graduate of the Kansas City College of Osteopathy and Surgery. He is Professor of Anatomy and Director of Graduate Education at the Kansas City College of Osteopathy and Surgery.

9:30 A.M.

The Spinal Component in Heart Disease

RICHARD S. KOCH, D.O., Olympia, Wash.

Dr. Koch is a graduate of the Kirksville College of Osteopathy and Surgery. He is a member of the Staff at Waldo General Hospital and at Standring Memorial Hospital.

9:50 A.M.

Treatment of Peptic Ulcer

OMAR C. LATIMER, B.S., D.O., New Milford, Conn.

Dr. Latimer is a graduate of the Kirksville College of Osteopathy and Surgery. He is a member of the Academy of Applied Osteopathy and of the New York Academy of Osteopathy.

10:10 A.M.

Ultrasonic Therapy

JOHN A. SCHUCK, D.O., Los Angeles

Dr. Schuck, a graduate of the College of Osteopathic Physicians and Surgeons, is attending physician at the Los Angeles County Osteopathic Hospital and Doctors Hospital. He is a member of the American Osteopathic College of Physical Medicine and Rehabilitation.

10:30 A.M.

Reflexes in Viscerosomatic and Somatosomatic Clinical Entities

FRED L. MITCHELL, D.O., Chattanooga, Tenn.

11:00 A.M.

Symposium: Functional Technic: The New England Academy of Applied Osteopathy

Moderator: EDWARD B. SULLIVAN, D.O., Boston

Theory and Concept: The Use of "Ease" and "Bind"

EDWARD B. SULLIVAN, D.O., Boston

Demonstration of Cervical and Thoracic Technic

WILLIAM L. JOHNSTON, D.O., Manchester, N.H.

Dr. Johnston is a graduate of the Chicago College of Osteopathy. He is a member of the New England Academy of Applied Osteopathy.

WILLIAM T. KNOWLES, D.O.,
North Eastham, Mass.

Demonstration of Lumbar and Sacroiliac Technic

LAWRENCE W. OSBORN, D.O., Worcester, Mass.

Dr. Osborn is a graduate of the Massachusetts College of Osteopathy. He is a member of the New England Academy of Applied Osteopathy.

WILLIAM T. KNOWLES, D.O.,
North Eastham, Mass.

12:00 Noon

Formal Closing of Convention

ROBERT D. McCULLOUGH, D.O., Tulsa, Oklahoma

Reserve Speakers

For New England Academy of Applied Osteopathy:
John P. Goodridge, D.O., Hartford, Conn.
Vincent N. Hammersten, D.O.,
Newton Highland, Mass.
Charles H. Bowles, D.O., Plymouth, N.H.

Instruction Courses

In Conjunction with the Annual Convention of the American Osteopathic Association

New York City, July, 1956

All courses will be conducted at the Philadelphia College of Osteopathy and its hospitals in Philadelphia during the week of July 9-14, 1956.

Special Course No. 1—Proctology
July 9-13, inclusive

A comprehensive 40-hour course in proctology which includes the anatomy, physiology, pathology, and methods of diagnosis and treatment of diseases of the anus and rectum. Didactic lectures are supplemented with clinical work in the hospitals and outpatient departments.

Faculty

WILLIAM BALDWIN, JR., A.B., D.O.
PROFESSOR, CHAIRMAN, DEPARTMENT OF PHYSIOLOGY AND PHARMACOLOGY

Dr. Baldwin, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Chairman of the Committee on Accreditation of Postgraduate Training of the American Osteopathic Association and a member of the Association's Panel for Evaluation of Therapeutics and Medical Agents. He is Chairman of the Department of Physiology and Pharmacology of the Philadelphia College of Osteopathy.

O. EDWIN OWEN, B.S., M.A., D.O.
PROFESSOR, CHAIRMAN,
DEPARTMENT OF PATHOLOGY

Dr. Owen, a graduate of the Des Moines Still College of Osteopathy and Surgery, is certified in Pathology. He is Chairman of the Department of Pathology and Director of Laboratories at the Philadelphia College of Osteopathy and its hospitals.

ENRIQUE G. VERGARA, A.B., D.O.
CLINICAL PROFESSOR,
DEPARTMENT OF PROCTOLOGY

Dr. Vergara, a graduate of the Philadelphia College of Osteopathy, is certified in Proctology. He is Clinical Professor and Director of Postgraduate Courses in Proctology at the Philadelphia College of Osteopathy and its hospitals.

J. CRAIG WALSH, D.O.
PROFESSOR, DEPARTMENT OF ANESTHESIOLOGY

Dr. Walsh, a graduate of the Philadelphia College of Osteopathy, is certified in Anesthesiology and is a Fellow of the American Osteopathic College of Anesthesiology. He is a staff member and a member of the Board of Directors of the Hospitals of the Philadelphia College of Osteopathy.

ANGUS G. CATHIE, D.O.
PROFESSOR, CHAIRMAN,
DEPARTMENT OF ANATOMY

MICHAEL M. COLEMAN, D.O.
ASSOCIATE, DEPARTMENT OF PROCTOLOGY

CAROLINE M. RENZI, D.O.
CLINICAL ASSISTANT,
DEPARTMENT OF PROCTOLOGY

Special Course No. 2—Cardiac Auscultation
July 9-10, inclusive

A 2-day course designed to familiarize the practicing physician with the types of heart disease in which the important findings are present on physical examination. Auscultation of the heart is studied under ideal conditions by use of the educational cardioscope whereby each student and the instructor listen at the same time to each patient.

Faculty

WILLIAM F. DAIBER, D.O.
PROFESSOR, CHAIRMAN,
DEPARTMENT OF OSTEOPATHIC MEDICINE

Dr. Daiber, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Chairman of the Department of Osteopathic Medicine and is Professor of

the Osteopathic Cardiovascular Program at the Philadelphia College of Osteopathy and its hospitals.

VICTOR R. FISHER, D.O.

CLINICAL PROFESSOR,
DEPARTMENT OF OSTEOPATHIC MEDICINE

Dr. Fisher, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Director of Postgraduate Studies and Clinical Professor of Osteopathic Medicine at the Philadelphia College of Osteopathy and is Attending Physician and Consultant in Internal Medicine at the Hospitals of the Philadelphia College of Osteopathy.

JOSEPH E. GILETTO, M.Sc., D.O.

LECTURER,
DEPARTMENT OF OSTEOPATHIC MEDICINE

Dr. Giletto is a graduate of the Philadelphia College of Osteopathy. He is a lecturer in the Department of Osteopathic Medicine at the Philadelphia College of Osteopathy and is a member of the staff of the Hospitals of the Philadelphia College of Osteopathy.

WILBUR P. LUTZ, D.O.

PROFESSOR,
DEPARTMENT OF OSTEOPATHIC MEDICINE

Dr. Lutz, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Professor of the Department of Osteopathic Medicine at the Philadelphia College of Osteopathy and is a member of the Attending and Consulting Staff in the Department of Osteopathic Medicine at the Hospitals of the Philadelphia College of Osteopathy.

NORMAN CASSETT, A.B., D.O.

SENIOR TEACHING FELLOW,
CARDIOVASCULAR DISEASE

Dr. Cassett is a graduate of the Philadelphia College of Osteopathy. He completed a residency training program in Internal Medicine at the Hospitals of the Philadelphia College of Osteopathy and is the Senior Teaching Fellow in Cardiovascular Diseases at the Philadelphia College of Osteopathy.

Special Course No. 3—Cardiac Arrest and Resuscitation

July 11

A 1-day course designed for surgeons, anesthesiologists, and physicians interested in the subject of cardiac arrest. A detailed discussion of the physiologic and pharmacologic principles as well as a practical working experience in the resuscitation of the acutely arrested heart will be presented. In addition to cadavers, live dogs will be used under the management of guest faculty experienced in animal anesthesia and surgery.

Faculty

WILLIAM BALDWIN, JR., A.B., D.O.

PROFESSOR, CHAIRMAN, DEPARTMENT OF PHYSIOLOGY AND PHARMACOLOGY

Dr. Baldwin, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Chairman of the Committee on Accreditation of Postgraduate Training of the American Osteopathic Association and a member of the Association's Panel for Evaluation of Therapeutics and Medical Agents. He is Chairman of the Department of Physiology and Pharmacology of the Philadelphia College of Osteopathy.

WILLIAM F. DAIBER, D.O.

PROFESSOR, CHAIRMAN,
DEPARTMENT OF OSTEOPATHIC MEDICINE

Dr. Daiber, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Chairman of the Department of Osteopathic Medicine and is Professor of the Osteopathic Cardiovascular Program at the Philadelphia College of Osteopathy and its hospitals.

VICTOR R. FISHER, D.O.

CLINICAL PROFESSOR,
DEPARTMENT OF OSTEOPATHIC MEDICINE

Dr. Fisher, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Director of Postgraduate Studies and Clinical Professor of Osteopathic Medicine at the Philadelphia College of Osteopathy and is Attending Physician and Consultant in Internal Medicine at the Hospitals of the Philadelphia College of Osteopathy.

O. EDWIN OWEN, B.S., M.A., D.O.

PROFESSOR, CHAIRMAN,
DEPARTMENT OF PATHOLOGY

Dr. Owen, a graduate of the Des Moines Still College of Osteopathy and Surgery, is certified in Pathology. He is Chairman of the Department of Pathology and Director of Laboratories at the Philadelphia College of Osteopathy and its hospitals.

J. CRAIG WALSH, D.O.

PROFESSOR, DEPARTMENT OF ANESTHESIOLOGY

Dr. Walsh, a graduate of the Philadelphia College of Osteopathy, is certified in Anesthesiology and is a Fellow of the American Osteopathic College of Anesthesiology. He is a staff member and a member of the Board of Directors of the Hospitals of the Philadelphia College of Osteopathy.

ANGUS G. CATHIE, D.O.

PROFESSOR, CHAIRMAN,
DEPARTMENT OF ANATOMY

ARTHUR M. FLACK, JR., A.B., D.O.

PROFESSOR, DEPARTMENT OF SURGERY

Special Course No. 4—Electrocardiography for Anesthesiologists

July 12-14, inclusive

A 3-day course designed to familiarize anesthesiologists with the basic physiology of the heart, certain aspects of electrocardiography, and the effect of the various agents upon the heart and the electrocardiogram. Several sessions are given in the operating room where operations are monitored on the cardioscope.

Faculty

WILLIAM BALDWIN, JR., A.B., D.O.
PROFESSOR, CHAIRMAN, DEPARTMENT OF PHYSIOLOGY AND PHARMACOLOGY

Dr. Baldwin, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Chairman of the Committee on Accreditation of Postgraduate Training of the American Osteopathic Association and a member of the Association's Panel for Evaluation of Therapeutics and Medical Agents. He is Chairman of the Department of Physiology and Pharmacology of the Philadelphia College of Osteopathy.

WILLIAM F. DAIBER, D.O.
PROFESSOR, CHAIRMAN, DEPARTMENT OF OSTEOPATHIC MEDICINE

Dr. Daiber, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Chairman of the Department of Osteopathic Medicine and is Professor of the Osteopathic Cardiovascular Program at the Philadelphia College of Osteopathy and its hospitals.

VICTOR R. FISHER, D.O.
CLINICAL PROFESSOR, DEPARTMENT OF OSTEOPATHIC MEDICINE

Dr. Fisher, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Director of Postgraduate Studies and Clinical Professor of Osteopathic Medicine at the Philadelphia College of Osteopathy and is Attending Physician and Consultant in Internal Medicine at the Hospitals of the Philadelphia College of Osteopathy.

JOSEPH E. GILETTO, M.Sc., D.O.
LECTURER, DEPARTMENT OF OSTEOPATHIC MEDICINE

Dr. Giletto is a graduate of the Philadelphia College of Osteopathy. He is a lecturer in the Department of Osteopathic Medicine at the Philadelphia College of Osteopathy and is a member of the staff of the Hospitals of the Philadelphia College of Osteopathy.

ANGUS G. CATHIE, D.O.
PROFESSOR, CHAIRMAN, DEPARTMENT OF ANATOMY

Special Course No. 5—The Vertebral Column—Developmental and Acquired Abnormalities

July 12-13, inclusive

A 2-day course of intensive study of the developmental and acquired abnormalities of the vertebral column. The course will include discussions of the following: developmental anatomy, radiologic anatomy, clinical evaluation, methodology of examination, traumatic mechanisms, scoliosis, infections, disc lesions, postural states, degenerative states, and neoplastic diseases.

Faculty

WILLIAM F. DAIBER, D.O.
PROFESSOR, CHAIRMAN, DEPARTMENT OF OSTEOPATHIC MEDICINE

Dr. Daiber, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Chairman of the Department of Osteopathic Medicine and is Professor of the Osteopathic Cardiovascular Program at the Philadelphia College of Osteopathy and its hospitals.

JAMES M. EATON, M.Sc., D.O.
PROFESSOR, ORTHOPEDIC SURGERY

Dr. Eaton, a graduate of the Philadelphia College of Osteopathy, is certified in Orthopedic Surgery and is a Fellow of the American College of Osteopathic Surgeons. He is Professor of Orthopedic Surgery and Chairman of the Department of Surgery of the Philadelphia College of Osteopathy and its hospitals and Chairman of the American Osteopathic Board of Surgery.

VICTOR R. FISHER, D.O.
CLINICAL PROFESSOR, DEPARTMENT OF OSTEOPATHIC MEDICINE

Dr. Fisher, a graduate of the Philadelphia College of Osteopathy, is certified in Internal Medicine and is a Fellow of the American College of Osteopathic Internists. He is Director of Postgraduate Studies and Clinical Professor of Osteopathic Medicine at the Philadelphia College of Osteopathy and is Attending Physician and Consultant in Internal Medicine at the Hospitals of the Philadelphia College of Osteopathy.

GEORGE W. NORTHUP, D.O.
VISITING LECTURER, DEPARTMENT OF OSTEOPATHIC PRINCIPLES AND TECHNICS

Dr. Northup is a graduate of the Philadelphia College of Osteopathy. He is a member of the Bureau of Professional Education and Colleges and of the Board of Trustees of the American Osteopathic Association.

O. EDWIN OWEN, B.S., M.A., D.O.
PROFESSOR, CHAIRMAN, DEPARTMENT OF PATHOLOGY

Dr. Owen, a graduate of the Des Moines Still College of Osteopathy and Surgery, is certified in Pathology. He is Chairman of the Department of Pathology and Director of Laboratories at the Philadelphia College of Osteopathy and its hospitals.

JOSEPH F. PY, M.Sc., D.O.
PROFESSOR, CHAIRMAN, DEPARTMENT OF MICROBIOLOGY AND PUBLIC HEALTH

Dr. Py is a graduate of the Philadelphia College of Osteopathy. He is a member of the American Public Health Association, the Pennsylvania Public Health Association, and the American Bacteriological Society.

A. ALINE SWIFT, M.Sc., D.O.
LECTURER, DEPARTMENT OF RADIOLOGY

Dr. Swift, a graduate of the Philadelphia College of Osteopathy, is certified in Radiology. She is an Associate and Lecturer in the Department of Radiology at the Philadelphia College of Osteopathy.

KENNETH L. WHEELER, M.Sc., D.O.
ASSOCIATE PROFESSOR DEPARTMENT OF RADIOLOGY

Dr. Wheeler, a graduate of the Philadelphia College of Osteopathy, is certified in Radiology and is

a Fellow of the American College of Osteopathic Surgeons. He is Associate Professor of Radiology at the Philadelphia College of Osteopathy and is a charter member of the American Osteopathic College of Radiology.

ANGUS G. CATHIE, D.O.

PROFESSOR, CHAIRMAN,
DEPARTMENT OF ANATOMY

EDGAR O. HOLDEN, A.B., D.O.

PROFESSOR, CHAIRMAN, DEPARTMENT OF
OSTEOPATHIC PRINCIPLES AND TECHNICS

PAUL T. LLOYD, M.Sc., D.Sc., D.O.

PROFESSOR, CHAIRMAN,
DEPARTMENT OF RADIOLOGY

FREDERICK A. LONG, M.Sc., D.O.

PROFESSOR, CHAIRMAN,
DEPARTMENT OF NEUROLOGY AND PSYCHIATRY

Schedule for Official Family

BOARD OF TRUSTEES
July 10-20—Penn Top-North

HOUSE OF DELEGATES
July 15-20—Skytop Room
Statler Hotel
New York

Tuesday, July 10
10:00-10:10 Executive Committee
10:10- 1:00 Board of Trustees
2:00- 6:00 Board of Trustees
*7:30-10:00 Board of Trustees

Wednesday, July 11
9:00- 1:00 Board of Trustees
2:00- 6:00 Board of Trustees
*7:30-10:00 Board of Trustees

Thursday, July 12
9:00- 1:00 Board of Trustees
2:00- 6:00 Board of Trustees
*7:30-10:00 Board of Trustees

Friday, July 13
9:00- 1:00 Board of Trustees
2:00- 6.00 Board of Trustees
*7:30-10:00 Board of Trustees

*Evening meetings will be called if necessity therefor is apparent.

Saturday, July 14
9:00- 1:00 Board of Trustees
2:00- 5:00 Board of Trustees

Sunday, July 15
9:00-12:00 Board of Trustees
12:00- 1:00 Registration of Delegates
1:00- 5:30 House of Delegates
7:00-10:30 House of Delegates

Monday, July 16
9:00-12:00 House of Delegates
1:30- 5:30 House of Delegates
7:00 President's Banquet, Reception and Ball—Grand Ballroom

Tuesday, July 17
8:00-10:00 Board of Trustees
10:00-12:00 House of Delegates
2:00- 6:00 House of Delegates
7:00 Fraternity and Sorority Banquets

Wednesday, July 18
8:00-11:00 Board of Trustees
11:00-12:00 A. T. Still Memorial Address—Grand Ballroom (Officers and Trustees attend in a body)
2:00- 6:00 House of Delegates
7:00 Alumni Banquets

Thursday, July 19
8:00-10:00 Board of Trustees
10:00-12:00 House of Delegates
2:00- 5:30 House of Delegates
7:00 Inaugural Banquet and Installation of Officers—Grand Ballroom

Friday, July 20
8:00-10:00 House of Delegates

LOCAL CONVENTION COMMITTEE

General Chairman—Sydney M. Kanev, D.O.
Honorary Chairmen—Charles E. Fleck, D.O.
Thomas R. Thorburn, D.O.
Assistant General Chairman—William D. Miller, D.O.
Secretary—A. Leon Smeyne, D.O.
Facilities—George F. Johnson, D.O.
Entertainment—W. Kenneth Riland, D.O.
Clinics—D. Leonard Vigderman, D.O.
Information and Local Transportation—
Harold S. Goldberg, D.O.
Attendance Promotion—Alexander Levitt, D.O.
Public Relations—Jacob G. Sheetz, D.O.
Assistants to the Chairman:
Henry W. Frey, Jr., D.O.
Martin Kurtz, D.O.
John J. Lalli, D.O.
Robert A. Marks, D.O.
Robert Sacks, D.O.

Department, Bureau, and Committee Meetings

DEPARTMENT OF PROFESSIONAL AFFAIRS

July 9, 8:30 p.m., Cabinet Meeting—Buffalo Room
Chairman—Alexander Levitt, D.O., Brooklyn

COMMITTEE ON ACCREDITATION OF POSTGRADUATE TRAINING

July 13, 14, all day and evening—Suite to be announced
Chairman—William Baldwin, Jr., D.O., Philadelphia
Secretary—Robert A. Steen, D.O., Chicago

1957 PROGRAM COMMITTEE

July 16, 12:30 p.m., Luncheon Meeting—Boston Room
Chairman—Neil R. Kitchen, D.O., Detroit, Mich.

CONVENTION CITY COMMITTEE

July 15, 7:30 a.m., Breakfast—Room 322
Chairman—E. H. McKenna, D.O., Muskegon Heights, Mich.

EDITORIAL LUNCHEON

July 18, 12:15 p.m., Luncheon Meeting—Boston Room
Co-Chairmen—Raymond P. Keesecker, D.O., Chicago
Mrs. Katherine Becker, Chicago

COMMITTEE ON CHRISTMAS SEALS

July 18, 12:30 p.m., Luncheon Meeting—Buffalo Room
Chairman—E. H. McKenna, D.O., Muskegon Heights, Mich.
Director—Mrs. Ann Conlisk, Chicago

Specialty Boards

ADVISORY BOARD FOR OSTEOPATHIC SPECIALISTS

July 15, 16, 17, all day and evening—Buffalo Room
July 15, Review Committee
Appeals Committee
Committee on New Boards
Chairman—Thomas J. Meyers, D.O., Pasadena, Calif.
Secretary—Robert A. Steen, D.O., Chicago

AMERICAN OSTEOPATHIC BOARD OF DERMATOLOGY AND SYPHILOLOGY

July 14, 7:00-10:00 p.m.—Suite to be announced
Chairman—Ronald W. MacCorkell, D.O., Los Angeles
Secretary-Treasurer—James D. Stover, D.O., Detroit

AMERICAN OSTEOPATHIC BOARD OF INTERNAL MEDICINE

July 14—Time and suite to be announced
Chairman—H. Earle Beasley, D.O., Boston
Secretary-Treasurer—Glennard E. Lahrson, D.O., Oakland, Calif.

AMERICAN OSTEOPATHIC BOARD OF NEUROLOGY AND PSYCHIATRY

July 12, 9:00 a.m.-6:00 p.m.—Buffalo Room
Chairman—K. Grosvenor Bailey, D.O., Los Angeles
Secretary-Treasurer—Thomas J. Meyers, D.O., Pasadena, Calif.

AMERICAN OSTEOPATHIC BOARD OF OBSTETRICS AND GYNECOLOGY

July 13, 9:00 a.m.-5:00 p.m.—Room 221
Chairman—Dorothy J. Marsh, D.O., Glendale, Calif.
Secretary-Treasurer—Jacquelin Bryson, D.O., Denver

AMERICAN OSTEOPATHIC BOARD OF PEDIATRICS

July 11, 12, 13, 9:00 a.m.-5:00 p.m.—Room 222
Chairman—William S. Spaeth, D.O., Drexel Hill, Pa.
Secretary-Treasurer—Evangeline N. Percival, D.O., Los Angeles

AMERICAN OSTEOPATHIC BOARD OF PHYSICAL MEDICINE AND REHABILITATION

July 13, 14, 9:00 a.m.-5 p.m.—Room 322
Chairman—W. W. Pritchard, D.O., Pasadena, Calif.
Secretary-Treasurer—Robert C. Ruenitz, D.O., Los Angeles

AMERICAN OSTEOPATHIC BOARD OF PROCTOLOGY

July 14, 9:00 a.m.-5:00 p.m.—Room 222
Chairman—Carl S. Stillman, Jr., D.O., San Diego, Calif.
Secretary-Treasurer—Carlton M. Noll, D.O., Denver

AMERICAN OSTEOPATHIC BOARD OF SURGERY

July 10-13 inclusive, all day and evening—Village Room
Chairman—James M. Eaton, D.O., Philadelphia
Secretary-Treasurer—Arthur M. Flack, Jr., D.O., Philadelphia

Affiliated Organizations

ACADEMY OF APPLIED OSTEOPATHY

July 14, 1:00-5:00 p.m., Executive Board—Suite to be announced

July 15, 9:00 a.m.-5:00 p.m.—Board of Governors—Boston Room

July 19, Board of Trustees—Time and place to be announced

July 20, 12:30 p.m., Luncheon—Penn Top-South
2:00-5:00 p.m., 7:00-9:30 p.m., Lecture Sessions—East Room

July 21, 9:00 a.m.-5:00 p.m.—Lecture Sessions—East Room

12:15 p.m., Luncheon for Board of Governors and Trustees—Buffalo Room

President—C. R. Nelson, D.O., San Antonio, Tex.
Secretary—Margaret W. Barnes, D.O., Carmel, Calif.

Friday, July 20

Afternoon

12:30 Academy Luncheon
Address of the President
C. R. Nelson, D.O., San Antonio, Tex.

2:00 A New Approach to Thoracic Anatomy
George Snyder, Ph.D., Kirksville, Mo.

3:00 Symposium on Pathologic Chest Conditions—New York Academy of Applied Osteopathy
D. Leonard Vigderman, D.O., Chairman, New York

5:00 Adjourn for the afternoon

Evening

7:00 Continuation of Symposium on Pathological Chest Conditions—New York Academy of Applied Osteopathy
D. Leonard Vigderman, D.O., Chairman, New York

9:00 The "X" Technic
T. J. Ruddy, D.O., Los Angeles, Calif.

9:30 General Osteopathic Session, Question Period, Practice
Experts conducting group teaching

10:15 Adjourn for the evening

Saturday, July 21

Morning

9:00 Shingles
Thomas F. Schooley, D.O., Phoenix, Ariz.

10:00 Preoperative and Postoperative Care
Galen S. Young, D.O., Philadelphia

11:00 Ninth Annual Academy Lecture—Osteopathic Thinking and Osteopathy in Disease Prevention
Asa Willard, D.O., Missoula, Mont.

12:00 Adjourn for the morning

Afternoon

2:00 The Basic Responsibilities of Osteopathic Education to Society
Robert B. Thomas, D.O., Huntington, W. Va.
Allan A. Eggleston, D.O., Montreal, Quebec, Canada

4:00 A Method of Myofascial Release in the Thoracic Area
Kenneth E. Little, D.O., Kansas City, Mo.

4:30 Practice Session

5:00 Adjourn Convention

Osteopathic Cranial Association

July 21, 6:00 p.m., Banquet—East Room

July 22, 9:00 a.m.-6 p.m., Lecture Session—East Room

President—Samuel H. Hitch, D.O., Lubbock, Tex.
Executive Secretary—Kenneth C. Little, D.O., Kansas City, Mo.

AMERICAN ASSOCIATION OF OSTEOPATHIC COLLEGES

July 13, 14, 9:00 a.m.-5:00 p.m.

President—R. N. MacBain, D.O., Chicago
Secretary—J. S. Denslow, D.O., Kirksville, Mo.

AMERICAN ASSOCIATION OF OSTEOPATHIC EXAMINERS

July 18, 12:00 noon, Luncheon Meeting—Hartford Room

President—Marion E. Coy, D.O., Jackson, Tenn.
Secretary-Treasurer—John H. Warren, D.O., Philadelphia

AMERICAN COLLEGE OF GENERAL PRACTITIONERS IN OSTEOPATHIC MEDICINE AND SURGERY

July 16, 8:00 a.m., Breakfast—Washington Room

July 16, 9:00 a.m.-6:00 p.m., Meeting—Dallas Room

President—H. W. Wagenseller, D.O., Beverly Hills, Calif.
Secretary—Alfred J. Schramm, D.O., Los Angeles

AMERICAN OSTEOPATHIC ACADEMY OF GERIATRICS

July 18, 19, 2:00-5:00 p.m., Meeting—Washington Room

July 20, 9:00 a.m.-12 noon, Meeting—Washington Room

President—E. H. McKenna, D.O., Muskegon Heights, Mich.
Secretary-Treasurer—J. K. Johnson, Jr., D.O., Jefferson, Iowa

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AMERICAN OSTEOPATHIC GOLF ASSOCIATION

July 17, 12:00 noon, Luncheon—Golf Club to be determined

July 17, 1:00 p.m., Golf Tournament—Golf Club to be determined

President—Harry P. Stimson, D.O., Highland Park, Mich.
Secretary-Treasurer—H. L. Gulden, D.O., Ames, Iowa
Program Chairman—John J. Lalli, D.O.
Jackson Heights, L.I., New York

AMERICAN OSTEOPATHIC SOCIETY FOR THE STUDY AND CONTROL OF RHEUMATIC DISEASES

July 18, 9:00 a.m.-12:00 noon, Lecture Sessions—Buffalo Room

President—Richard A. Schaub, D.O., Pasadena, Calif.
Secretary-Treasurer—E. C. Andrews, D.O., Ottawa, Ill.

Wednesday, July 18

Morning

9:00 Histopathology and Gross Pathology in Rheumatoid Arthritis
Wilbur V. Cole, D.O., Kansas City, Mo.

9:45 Drug Therapy including Gold and the Steroids in the Treatment of Rheumatoid Arthritis
Richard A. Schaub, D.O., Pasadena, Calif.

10:30 Osteopathic Manipulation, Psychogenic Factors, and Management in Rheumatoid Arthritis
Max Ackerman, D.O., Bronx, New York

11:15 Osteopathic Management of Rheumatoid Arthritis
Jacobine Kruze, D.O., Ottawa, Ill.

12:00 Adjournment

ASSOCIATION OF OSTEOPATHIC PUBLICATIONS

July 14, 12:30 p.m., Luncheon Meeting with the Society of Divisional Secretaries—Washington Room

President—Mr. Wendell Fuller, Des Moines, Iowa
Secretary-Treasurer—Miss Josephine Seyl, Chicago
Program Chairman—Mr. Douglas O. Durkin, Chicago

Saturday, July 14

12:30 Luncheon

2:00 Design: From Diurnal Journals to Annual Manuals

MR. DOUGLAS RADER, VICE PRESIDENT OF DURKIN AND RADER, INC., CHICAGO

A chalk talk giving practical demonstrations of simple, easy-to-use tricks of layout, which can improve the appearance of osteopathic periodicals.

2:45 A.O.P. Problem Clinic

A new approach to the problems of osteopathic journalism, in which the panel of experts will be made up of all editors attending the meeting. Problems to be discussed will include: News Gathering, Limited Budgets, News Content, Publication Improvement, and Should We Publish?

4:30 Business Meeting of the Association of Osteopathic Publications

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AUXILIARY TO THE AMERICAN OSTEOPATHIC ASSOCIATION

July 14, 9:00 a.m.-5:00 p.m., 8:00-10:00 p.m., Executive Board Meetings—Boston Room

July 15, 1:00-4:30 p.m., Presidents' Council and Luncheon Meeting—Washington Room

July 16, 9:30 a.m.-12 noon, Formal Opening of House of Delegates—Penn Top South
3:00-5:00 p.m., A.O.A. Social Event for All Women Guests—Penn Top South

July 17, 9:00-11:00 a.m., House of Delegates—Penn Top South
11:00 a.m.-12 noon, Educational Speaker (to be announced)—Penn Top South
2:00-5:00 p.m., House of Delegates—Penn Top South

July 18, 9:00-10:45 a.m., House of Delegates—Penn Top South
11:00 a.m., Andrew Taylor Still Memorial Lecture—Grand Ballroom
1:00-3:00 p.m., Workshop Meetings—Penn Top South
3:15-4:30 p.m., Social Hour—Penn Top South
4:30-6:00 p.m., Meeting of Newly Elected Officers—Suite to be announced

July 19, 9:00 a.m.-12 noon, House of Delegates—Penn Top South
1:00 p.m., Luncheon Honoring Newly Elected Officers—Penn Top South
Address: Mrs. W. H. Bethune, Grand Rapids, Mich., Incoming President
Entertainment

July 20, 9:00 a.m., Conferences to be arranged by Mrs. Bethune—Locations to be announced
1:00 p.m.-5:30 p.m., Executive Board Meeting—Boston Room

July 21, 9:00 a.m.-12 noon, Executive Board Meeting—Boston Room

President—Mrs. George S. Cozma, Cleveland, Ohio
Recording Secretary—Mrs. Henry L. McDowell, Norwalk, Calif.

GAVEL CLUB

July 16, 7:00 a.m., Breakfast Meeting—Boston Room

President—C. Robert Starks, D.O., Denver, Colo.
Secretary-Treasurer—Robert B. Thomas, D.O., Huntington, W. Va.

NATIONAL BOARD OF EXAMINERS FOR OSTEOPATHIC PHYSICIANS AND SURGEONS

July 14, 15, 9:00 a.m.-5:00 p.m.—Room 221

President—S. V. Robuck, D.O., Chicago
Secretary-Treasurer—Paul van B. Allen, D.O., Indianapolis

THE OSTEOPATHIC FOUNDATION

Date and space to be announced

President—Hobert C. Moore, D.O., Bay City, Mich.
Secretary—R. C. McCaughan, D.O., Chicago

OSTEOPATHIC TRUST

Date and space to be announced

Chairman—H. Dale Pearson, D.O., Erie, Penna.
Secretary—R. C. McCaughan, D.O., Chicago

OSTEOPATHIC VOCATIONAL GROUP OF ROTARY INTERNATIONAL

July 19, 12:15 p.m., Luncheon—Dallas Room

President—Charles L. Naylor, D.O., Ravenna, Ohio
Secretary-Treasurer—Russell Peterson, D.O., Phoenix, Ariz.

OSTEOPATHIC WAR VETERANS ASSOCIATION

July 17, 12:30 p.m., Luncheon—East Room

President—(Vacancy)
Secretary-Treasurer—True B. Eveleth, D.O., Chicago

OSTEOPATHIC WOMEN'S NATIONAL ASSOCIATION

July 15, 3:00 p.m., Executive Committee Meeting—Room 322

July 15, 7:00 p.m., Dinner Meeting—Boston Room

Guest Speakers: Mr. Lawrence W. Mills, Chicago
DIRECTOR OF EDUCATION
AMERICAN OSTEOPATHIC ASSOCIATION
Edwin F. Peters, Ph.D., Des Moines, Iowa
PRESIDENT, DES MOINES STILL COLLEGE OF OSTEOPATHY AND SURGERY

July 18, 12:15 p.m., Luncheon Meeting—Dallas Room

Guest Speaker: How to Live with Yourself
Murray Banks, Ph.D., New York

President—Louise W. Astell, D.O., Champaign, Ill.
Secretary-Treasurer—Arvilla McCall Rose, D.O., Evanston, Ill.

SOCIETY OF DIVISIONAL SECRETARIES

July 13, 9:00 a.m.-5:00 p.m.—Washington Room

July 14, 9:00 a.m.-12:00 noon—Washington Room

July 14, 12:30 p.m.—Joint Luncheon with A.O.A.—Washington Room

President—Mr. I. J. Tecker, Riverside, N.J.
Secretary-Treasurer—Mr. Paul D. Adams, Jefferson City, Mo.

STILL, A. T., OSTEOPATHIC FOUNDATION AND RESEARCH INSTITUTE

Date and space to be announced

Chairman—Allan A. Eggleston, D.O., Montreal, Quebec, Canada
Secretary—R. C. McCaughan, D.O., Chicago

Specialty Colleges

AMERICAN COLLEGE OF NEUROPSYCHIATRISTS

July 13, 14, 15, 9:00 a.m.-5:00 p.m.—Dallas Room

July 13, 12:30 p.m., Luncheon for Fellows—Boston Room

July 13, 7:00 p.m., Dinner—Washington Room

President—Ralph I. McRae, D.O., Dallas, Tex.
Secretary-Treasurer—Don C. Littlefield, D.O., Long Beach, Calif.

AMERICAN COLLEGE OF OSTEOPATHIC INTERNISTS

July 16 (Time to be announced)—Suite to be announced

President—Earl F. Riceman, D.O., Philadelphia
Secretary-Treasurer—Glennard E. Lahrson, D.O., Oakland, Calif.

AMERICAN COLLEGE OF OSTEOPATHIC OBSTETRICIANS AND GYNECOLOGISTS

July 13, 14, 9:00 a.m.-5:00 p.m.—Hartford Room

President—Richard E. Eby, D.O., Pomona, Calif.
Secretary-Treasurer—Harold Kent Morgan, D.O., Denver

AMERICAN COLLEGE OF OSTEOPATHIC PEDIATRICIANS

July 12, 9:00 a.m.-5:00 p.m.—Committee Meetings—East Room

6:00 p.m., Dinner for Board of Directors—Room 322

July 13, 9:00 a.m.-5:00 p.m., Business Meeting of the College—East Room

July 14, 9:00 a.m.-4:00 p.m., Lecture Sessions—East Room

6:00 p.m., Reception sponsored by Borden Company—Washington Room

7:00 p.m., Banquet and Installation of Officers—East Room

President—Robert R. Tonkens, D.O., Kansas City, Mo.
Secretary-Treasurer—Harold H. Finkel, D.O., Ephrata, Pa.

Saturday, July 14

Morning

9:00 Review of Premature Infant Care
Nelson D. King, D.O., Boston

10:00 Anesthesia in Pediatrics
Walter B. Underwood, Jr., D.O., Camden, N.J.

11:00 Minor Surgery in the Child
Herman F. Cohen, D.O., Philadelphia

12:00 Recess for luncheon

Afternoon

2:00 Management of Diabetes Mellitus
William S. Spaeth, D.O., Drexel Hill, Pa.

3:00 Foot Disorders in the Preschool Child
John P. Wood, D.O., Birmingham, Mich.

4:00 Present Status of Antibiotic Therapy in Children
Samuel L. Caruso, D.O., Philadelphia

5:00 Adjournment

AMERICAN COLLEGE OF OSTEOPATHIC SURGEONS

July 14-21 inclusive, all day and evening—Village Room

President—J. Donald Sheets, D.O., Highland Park, Mich.
Secretary-Treasurer—Charles L. Ballinger, D.O., Toledo, Ohio
Executive Secretary—Orel F. Martin, D.O., Coral Gables, Fla.

AMERICAN OSTEOPATHIC COLLEGE OF ANESTHESIOLOGISTS

July 15, 9:00 a.m.-5:00 p.m., Meeting—Room 222
12:30 p.m., Luncheon—Room 222

President—William A. Gants, D.O., Providence, R.I.
Secretary-Treasurer—Crawford M. Esterline, D.O., Kirksville, Mo.

AMERICAN OSTEOPATHIC COLLEGE OF PATHOLOGISTS

July 16, 17, 9:00 a.m.-5:00 p.m., Meetings—Hartford Room
July 17, 12:15 p.m., Luncheon—Dallas Room

President—George E. Himes, D.O., Flint, Mich.
Secretary-Treasurer—Arthur L. Wickens, D.O., Mount Clemens, Mich.

Monday, July 16

Morning

9:00-11:30 Seminar for Members of the College
Norman W. Arends, D.O., Detroit

Afternoon

(Afternoon Sessions are open to A.O.A. Convention Registrants)

2:00- 2:50 Mortality Review and Tissue Committee
Clyde C. Henry, D.O., Denver

3:00- 3:50 The Uses and Abuses of Whole Blood
William J. Loos, D.O., Detroit

4:00- 4:30 The Biopsy as a Diagnostic Procedure
Otterbein Dressler, D.O., Detroit

Tuesday, July 17

Morning

9:00-11:30 Seminar for Members of the College
Reticuloendothelial Diseases
William L. Silverman, D.O., Philadelphia

12:15- 2:00 Luncheon

Afternoon

(Afternoon Sessions are open to A.O.A. Convention Registrants)

2:00- 2:50 Immunohematology
George E. Himes, D.O., Flint, Mich.

3:00- 3:50 The Endoscopist and Pathologist in Diagnosis
Thomas J. Miller, D.O., Portland, Me.

4:00- 4:50 Compilation of Autopsy Protocol and Tissue Reports
Robert P. Morhardt, D.O., South Pasadena, Calif.

AMERICAN OSTEOPATHIC COLLEGE OF PHYSICAL MEDICINE AND REHABILITATION

July 17, 12:00 noon, Luncheon Meeting—Washington Room

President—Glenn Ulansey, D.O., Philadelphia
Secretary-Treasurer—John A. Schuck, D.O., Los Angeles

Alumni Associations

CHICAGO COLLEGE OF OSTEOPATHY

July 18, 7:00 p.m., Dinner—Location to be selected

President—A. F. Kull, D.O., South Bend, Ind.
Secretary-Treasurer—Ward E. Perrin, D.O., Chicago

DES MOINES STILL COLLEGE OF OSTEOPATHY AND SURGERY

July 18, 6:00 p.m., Dinner—East Room

President—Donald E. Sloan, D.O., Des Moines, Iowa
Secretary-Treasurer—Anna L. Slocum, D.O., Des Moines, Iowa
Executive Secretary—Mr. Wendell R. Fuller, Des Moines, Iowa

KIRKSVILLE COLLEGE OF OSTEOPATHY AND SURGERY

July 17, 18, 8:00-10:00 a.m., House of Delegates—Washington Room
July 18, 6:30 p.m., Dinner—Penn Top South

President—Lester J. Vick, D.O., Amarillo, Tex.
Secretary—Kenneth I. MacRae, D.O., Cass City, Mich.

PHILADELPHIA COLLEGE OF OSTEOPATHY

July 18, 6:00 p.m., Dinner—Washington Room

President—Arnold Melnick, D.O., Philadelphia
Secretary—H. Willard Sterrett, Jr., D.O., Philadelphia

Fraternities and Sororities

NATIONAL OSTEOPATHIC INTERFRATERNITY COUNCIL

July 17, 12:30 p.m., Luncheon Meeting—Boston Room

President—Donald E. Sloan, D.O., Des Moines, Iowa
Executive Secretary-Treasurer—Floyd E. Dunn, D.O., Kansas City, Mo.

ATLAS CLUB

July 17, 8:00 a.m., Breakfast, Board of Governors—Boston Room
7:00 p.m., Dinner—Penn Top South

President—Alex B. Wilcox, D.O., Los Angeles
Secretary-Treasurer—Guy A. Lowery, D.O., Eaton Rapids, Mich.

DELTA OMEGA

July 17, 7:00 p.m., Dinner—Boston Room

President—Edith W. Pollock, D.O., Quincy, Ill.
Secretary—Rosamund Pocock, D.O., Toronto, Ontario, Canada

PHI SIGMA GAMMA

July 16, 12:15 p.m., Luncheon for officers—Room 222
July 17, 6:00 p.m., Cocktail Hour—Dallas Room
7:30 p.m., Dinner—Dallas Room

President—Theodore F. Classen, D.O., Cleveland
Secretary-Treasurer—Floyd E. Dunn, D.O., Kansas City, Mo.

PSI SIGMA ALPHA

July 18, 8:00 a.m., Breakfast Meeting—Boston Room

President—Verner J. Ames, D.O., Pineville, W. Va.
Executive Secretary-Treasurer—John W. Hayes, D.O., East Liverpool, Ohio

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SIGMA SIGMA PHI

July 15, 5:30 p.m., Business Meeting—Hartford Room

6:00 p.m., Reception—Hartford Room

President—H. Dale Pearson, D.O., Erie, Pa.
Secretary-Treasurer—S. V. Robuck, D.O., Chicago

THETA PSI

July 17, 7:30 p.m., Dinner—Buffalo Room

President—Kirk L. Hilliard, D.O., Pleasantville, N.J.
Secretary-Treasurer—E. P. Carlton, D.O., Fort Worth, Tex.

Scientific Exhibits

Chairman—Wilbur V. Cole, Kansas City, Mo.

Schute Institute, London, Ontario, Canada
Studies in Peripheral Vascular Disease

Des Moines Still College of Osteopathy and Surgery
Photographs of Gross Lesions of the Skin and Viscera
E. Lynn Baldwin

Kansas City College of Osteopathy and Surgery
Comparative Morphology of the Motor Endings of Striated Muscle in the Vertebrates and the Mammal
Wilbur V. Cole, D.O.

The Philadelphia College of Osteopathy
Composite Study of a Pathologic Entity
(Several departments are to contribute anatomy, pathology, and treatment)

Facial Reconstructions
E. Ivan Cherashore, D.O.

Kirksville College of Osteopathy and Surgery, Rural Clinics
Description of the Rural Clinic Training Program

Kansas City College of Osteopathy and Surgery, Cancer Teaching Program (U.S.P.H.)
Photographs Showing the Diagnosis of Malignant Lesions
L. Raymond Hall, D.O.

Psychiatric Art Exhibition
Earl W. Fitz, D.O.

Kirksville College of Osteopathy and Surgery
The Use of Line Drawings in Psychiatric Diagnosis
Fleda M. Brigham, D.O.

Kansas City College of Osteopathy and Surgery
Fluorescent Microscopy in the Demonstration of Nerve and Epithelial Tissue
J. E. Mielcarek

White Laboratory
The Diagnosis of Abnormal Heart Sounds

Psychiatric Art Demonstration of Psychological Changes—A Case Study
Frank H. Caffin, D.O.

RULES CONCERNING A.O.A. CONVENTION INVITATIONS

In relation to the formal invitation to this Association to hold an annual convention in a particular place, the Constitution of the American Osteopathic Association was amended at the 1951 convention to provide that "the House may take action covering not more than five succeeding conventions." Therefore, it will be possible, but not mandatory, for the House of Delegates at the 1956 convention in New York to select the convention city for the 1960 and 1961 conventions.

Formal invitations must be received not less than 60 days before the convention, and in such invitation the inviting city is required to give detailed description of physical facilities available and of a local organization now set up or to be set up. The descriptive information is an essential part of the convention invitation, and failure to provide it will bar consideration of the invitation by the Convention City Committee and by the House of Delegates. The Convention City Committee is composed of E. H. McKenna, chairman, Lawrence C. Boatman, Alden Q. Abbott, R. C. McCaughan, and C. N. Clark.

Following are the formal rules involved:

"The invitations shall be received not less than sixty days before the time of selection of convention city so that plenty of time may be offered for investigation. Inviting cities shall in their invitation give detailed description of physical facilities and of their local organization. These descriptions shall be exact, and failure to provide this information to the Committee shall bar consideration of the invitation by the Committee and the House of Delegates.

"The Committee shall report its findings, recommendations, and reasons therefor to the Board and the House of Delegates early in the annual sessions each year so that adequate time may be had for discussion before a decision is arrived at on location by the House. The House shall give serious consideration to the recommendation of the Committee. The Committee may recommend one city or more than one if two alternatives seem equally acceptable. In recommending a convention city the Committee shall consider the following factors listed in the order of their importance:

(a) Physical facilities for general and sectional and affiliated groups' programs, and for housing attendants.
(b) Location of city for drawing largest attendance.
(c) Clinical facilities (legal status of profession).
(d) Location of city as drawing card for exhibitors.
(e) Physical facilities as a drawing card for exhibitors.
(f) Expense to the Association in putting on convention.
(g) Intraprofessional good will promotion, here considering location and success of previous conventions.
(h) Public relations of the profession.
(i) Ability of the local group to provide the necessary local committee.
(j) Available entertainment for members' families.

"Divisional societies or associations extending convention city invitations shall be requested to give detailed description of physical facilities of their city and their local organization. All such communications shall be presented to the Convention City Committee not less than sixty days before the time of selection of the convention city."

R. C. McCaughan, D.O.
Executive Secretary

The Technical Exhibitors

CLAYTON N. CLARK, D.O., Manager of Exhibits

The following firms have reserved exhibit space for the New York Convention. We urge the profession to visit the booths of these companies, not only to show appreciation for their cooperation and support but to obtain highly interesting and very useful information concerning the wide variety of products.

HOTEL STATLER, NEW YORK—JULY 16-20

Technical Exhibitors	Exhibit Space
ABBOTT LABORATORIES 14th & Sheridan Rd., North Chicago, Ill.	36
THE ALKALOL CO. Box 350, Taunton, Mass.	79
A. S. ALOE CO. 1831 Olive St., St. Louis 3, Mo.	51
AMERICAN FERMENT CO. 1450 Broadway, New York 18, N.Y.	46
AMERICAN HOSPITAL & SUPPLY CO. 2020 Ridge Ave., Evanston, Ill.	12-13
AMERICAN STERILIZER CO. Box 620, Erie, Pa.	107-108
AMES COMPANY, INC. 819 McNaughton Ave., Elkhart, Ind.	111
AUTONOMIC EQUIPMENT CO. 303 S. Franklin St., Kirksville, Mo.	6
AYERST LABORATORIES 22 E. 40th St., New York 16, N.Y.	102
V. RAY BENNETT & ASSOCIATES, INC. 320 S. Robertson Blvd., Los Angeles 48, Calif.	59
THE BLAKISTON DIVISION, McGRAW-HILL BOOK CO., INC. 330 W. 42nd St., New York 36, N.Y.	30
BORCHERDT CO. 217 N. Wolcott Ave., Chicago 12, Ill.	27
THE BORDEN CO. 350 Madison Ave., New York 17, N.Y.	42
BRISTOL LABORATORIES 630 Fifth Ave., New York 20, N.Y.	96
BRISTOL-MYERS CO. 630 Fifth Ave., New York 20, N.Y.	109
BUFFALOW MFG. CO. 915 Volunteer Bldg., Chattanooga, Tenn.	75-76
BURDICK CORPORATION Milton, Wis.	20
BURROUGHS WELLCOME & CO., INC. 1 Scarsdale Road, Tuckahoe 7, N.Y.	43
S. H. CAMP & CO. 109 W. Washington St., Jackson, Mich.	103
CARNATION CO. 5045 Wilshire Blvd., Los Angeles 36, Calif.	39
CHATTANOOGA PHARMACAL CO., INC. 2400 Dayton Blvd., Chattanooga, Tenn.	93
CHICAGO PHARMACAL CO., INC. 5547 Ravenswood Ave., Chicago 40, Ill.	23
COLES ELECTRONIC CORP. 1207 Race St., Philadelphia 7, Pa.	49
CONNECTICUT BANDAGE MILLS 38-40 Poland St., Bridgeport, Conn.	69
CORECO RESEARCH CORP. 159 West 25th St., New York 1, N.Y.	91
F. A. DAVIS CO. 1914 Cherry St., Philadelphia 3, Pa.	44
DE PUY MFG. CO. Warsaw, Ind.	116
DESITIN CHEMICAL CO. 70 Ship St., Providence 2, R. I.	65
DIETENE CO. 3017 Fourth Ave. So., Minneapolis 15, Minn.	26
DOHO CHEMICAL CORP. 100 Varick St., New York 13, N.Y.	16
DOME CHEMICALS, INC. 109 W. 64th St., New York 23, N.Y.	68
EISELE & CO. 400 First Ave., N., Nashville 3, Tenn.	54
ELECTRO-THERAPEUTICS INSTRUMENT CO. 5752 N. Milwaukee Ave., Chicago 30, Ill.	99
ENCYCLOPEDIA AMERICANA 202 Benjamin Ave., S. E., Grand Rapids, Mich.	90
ENCYCLOPEDIA BRITANNICA, INC. 14 E. Jackson Blvd., Chicago 4, Ill.	9
ENDOCRINE CO. 4409 Park Ave., Union City, N.J.	101
ENDO LABORATORIES 84-40 101 St., Richmond Hill 18, N.Y.	71
EVAPORATED MILK ASSOCIATION 228 N. La Salle St., Chicago 1, Ill.	62
M. G. FARNSWORTH & CO. 5443 N. Broadway, Chicago 40, Ill.	86
C. B. FLEET & CO., INC. 921 Commerce St., Lynchburg, Va.	18
E. FOUGERA & CO., INC. 75 Varick St., New York 13, N.Y.	67
GRAVITATOR Mulberry & Cathedral Sts., Baltimore 1, Md.	25
GRAY PHARMACEUTICAL CO., INC. 50 Hunt St., Newton 58, Mass.	106
GRUNE & STRATTON, INC. 381 Fourth Ave., New York 16, N.Y.	95
HILL LABORATORIES, CO. Malvern 2, Frazer, Pa.	61
HOLLAND-RANTOS CO., INC. 145 Hudson St., New York 13, N.Y.	35
HOMEMAKER'S PRODUCTS CORP. 380 Second Ave., New York 10, N.Y.	92
JOHNSON & JOHNSON New Brunswick, N.J.	72
KNOX GELATINE CO., INC. 412 Knox Ave., Johnstown, N.Y.	112
LEDERLE LABORATORIES Pearl River, N.Y.	40
J. B. LIPPINCOTT CO. E. Washington Sq., Philadelphia 5, Pa.	45
LOMA LINDA FOOD CO. Arlington, Calif.	114
DUNCAN C. McLINTOCK CO., INC. 59-60 Oak St., Hackensack, N.J.	110
McMANIS TABLE CO. 314 S. Marion St., Kirksville, Mo.	60
McNEIL LABORATORIES, INC. 2900 N. 17th St., Philadelphia 32, Pa.	28
MEAD JOHNSON & CO. 2404 W. Pennsylvania St., Evansville 21, Ind.	115
MEDCO PRODUCTS CO., INC. 3603 E. Admiral Place, Tulsa 12, Okla.	31
MEDIC-AIRE 564 So. Warwick St., St. Paul 5, Minn.	50
WM. S. MERRELL CO. Amity Road, Reading, Cincinnati 15, Ohio.	53
METABOLIC PRODUCTS CORP. Little Bldg., Boston 16, Mass.	80
MILEX OF NEW YORK 45-45 44th St., Long Island City 4, N.Y.	29
THE C. V. MOSBY CO. 3207 Washington Blvd., St. Louis 3, Mo.	66
NATIONAL ELECTRIC INSTRUMENT CO., INC. 92-21 Corona Ave., Elmhurst 73, N.Y.	88
NEPERA CHEMICAL CO., INC. 21 Gray Oaks Ave., Yonkers 2, N.Y.	78
THE NETTLESHIP CO. 1212 Wilshire Blvd., Los Angeles 14, Calif.	52
NORTH AMERICAN PHILIPS CO., INC. 750 S. Fulton St., Mount Vernon, N.Y.	81-82
ORGANON, INC. 20 Main St., Orange, N.J.	17
OTTAWA ARTHRITIS SANATORIUM & DIAGNOSTIC CLINIC 900 E. Center St., Ottawa, Ill.	38
PARKE DAVIS & CO. 1 McDougall St., Detroit 32, Mich.	89
PET MILK CO. 812 Olive St., St. Louis 1, Mo.	98
CHAS. PFIZER & CO., INC. 630 Flushing Ave., Brooklyn 6, N.Y.	57
PHYSIOLOGICAL CHEMICALS, INC. 3 Le Fevre Lane, New Rochelle, N.Y.	56
PITMAN-MOORE CO. 1200 Madison Ave., Indianapolis 6, Ind.	41
PROFESSIONAL FOODS 319 Second Ave., S.W., Cedar Rapids, Iowa.	70
PURDUE FREDERICK CO. 135 Christopher St., New York 14, N.Y.	32
RITTER CO., INC. 400 West Ave., Rochester 3, N.Y.	87
A. H. ROBINS CO., INC. 1407 Cummings Drive, Richmond 20, Va.	22
J. B. ROERIG & CO. 536 Lake Shore Drive, Chicago 11, Ill.	105
ROSS LABORATORIES 625 Cleveland Ave., Columbus 16, Ohio.	37
SACRO-ILIAC BELT CO. Carroll, Iowa.	34
SANBORN CO. 39 Osborn St., Cambridge 39, Mass.	48
SANDOZ PHARMACEUTICALS Route 10, Hanover, N.J.	104
SCHERING CORP. 60 Orange St., Bloomfield, N.J.	84-85
JULIUS SCHMID, INC. 423 W. 55th St., New York 19, N.Y.	94
SEALY, INC. 666 Lake Shore Drive, Chicago 11, Ill.	4-5
SMITH, KLINE & FRENCH CO. 1530 Spring Garden St., Philadelphia 30, Pa.	24
MARTIN H. SMITH CO. 131 East 23rd St., New York 10, N.Y.	74
SPENCER, INC. 135 Derby Ave., New Haven 7, Conn.	97
THE SPINALATOR CO. P. O. Box 826, Asheville, N.C.	58
E. R. SQUIBB & SONS 745 Fifth Ave., New York 22, N.Y.	21
TESTAGAR & CO., INC 1354 W. Lafayette, Detroit 26, Mich.	10
GEORGE C. TONG CO. 5912 Delmar Blvd., St. Louis 12, Mo.	2
THE UPJOHN CO. 301 Henrietta St., Kalamazoo, Mich.	33
U. S. VITAMIN CORP. 250 E. 43rd St., New York 17, N.Y.	83
VITAMINERALS, INC. 1815 Flower St., Glendale, Calif.	113
V-M NUTRI-FOOD, INC. P.O. Box 233, Wilmette, Ill.	100
WAITE PHARMACAL CO., INC. 5443 N. Broadway, Chicago 40, Ill.	86
THE WARNER CO. Warner Bldg., Idaho Falls, Idaho.	55
WHITE LABORATORIES, INC. Kenilworth, N.J.	19
WINTHROP LABORATORIES 1450 Broadway, New York 18, N.Y.	64
WYETH LABORATORIES Radnor, Pa. (Philadelphia 1, Pa.)	47
F. E. YOUNG & CO. 8057 Stony Island Ave., Chicago 17, Ill.	63

Proposed Amendments to the Constitution and Bylaws and Code of Ethics of the American Osteopathic Association

R. C. McCAUGHAN, D.O.
Executive Secretary

CONSTITUTION

Article X—Amendments

(The following proposed amendment is published at the request of the Executive Secretary in order to correct a grammatical error. The amendment was read to the 1955 House of Delegates and can be acted upon by the 1956 House.)

Amend Article X by deleting in the last line of the article the words "it is," and substituting therefor the words "they are." The article would then read: "This Constitution may be amended by the House at any annual meeting, by a two-thirds vote of the accredited voting Delegates at such meeting, provided that such amendments shall have been presented to the House and filed with the Secretary at a previous annual meeting, and that the Secretary shall have them printed in THE JOURNAL not less than two months nor more than four months previous to the meeting at which they are to be acted upon."

BYLAWS

Article IV—Fees and Dues

(The following proposed amendments are published in order to correct in the Bylaws the name of the Osteopathic Magazine which was changed by the House of Delegates in 1955.)

Amend Section 1 by deleting in the first sentence of the second paragraph the words "OSTEOPATHIC MAGAZINE" and substituting therefor the words "HEALTH—an osteopathic publication."

Amend Section 4 by deleting the words "OSTEOPATHIC MAGAZINE" and substituting therefor the words "HEALTH —an osteopathic publication."

(The following proposed amendment is published at the direction of the Board of Trustees. It provides for a reduced rate of membership dues for members engaged in full-time fellowship training programs.)

Amend Section 1 by inserting between the present fourth and fifth paragraphs, the following paragraph:

Dues for regular members engaged in full-time fellowship training approved by the American Osteopathic Association shall be twenty dollars ($20.00) per year during the period of such fellowship training. (Such a full-time fellowship is defined as a course formally conducted in the Colleges or graduate schools of the Colleges, occupying the entire time of the fellow. Said fellow is to be registered as a student in the College and assigned to the respective department head for conduct of formal program.)

Article V—Delegates: Methods of Election and Duties

(The following proposed amendment is published at the direction of the House of Delegates and would advance the date for certification of Delegates to the A.O.A. convention by thirty days in order to facilitate hotel reservations for delegates at the annual convention.)

Amend Section 1 by changing in lines two and three of the first paragraph, the figure "60" to the figure "75." The paragraph would then read:

"Sec. 1. The Executive Secretary of this Association shall furnish to the secretary of each divisional society, 75 days before the first day of the annual meeting of the House of Delegates, and not again until 75 days before the next annual meeting of the House of Delegates, a statement of the number of regular members of this association located in the territory represented by that divisional society."

Further amend Section 1 by changing in the last line of the second paragraph of that Section the figure "15" to the figure "45." The sentence would then read:

"The secretary of each divisional society shall certify its Delegates to the Executive Secretary of this Association in writing or by wire at least 45 days prior to the first day of the annual meeting of the House of Delegates."

Article VIII—Duties of Officers

(The following proposed amendment is published at the direction of the Board of Trustees. It would remove from the Bylaws the provision that the Editor shall be the director of public education in general.)

Amend Section 6 by deleting therefrom paragraph (b) which reads: "He shall be the director of public education in general."

If the previous proposed amendment shall be adopted, further amend Section 6 by relettering present paragraphs (c) and (d) as paragraphs (b) and (c), respectively.

(The following proposed amendment is published at the direction of the Board of Trustees and would require that the Treasurer provide quarterly rather than monthly financial reports to the Board.)

Amend Section 4 by deleting, in the third line of paragraph (c), the word "monthly" and substituting therefor the word "quarterly."

Article IX—Duties of Board of Trustees

(The following proposed amendment is published at the request of the Committee on Ethics and Censorship in order to revise the procedure with regard to alleged violations of the Code of Ethics by members of the Association.)

Amend Article IX by deleting the entire section 7 and substituting therefor the following:

Sec. 7. The Board of Trustees shall decide finally all questions of an ethical or judicial character and shall have investigated by the Committee on Ethics and Censorship all charges of violation of the Constitution, By-Laws or Code of Ethics or of grossly unprofessional conduct of any member and shall have the power to censure, place on probation for not exceeding a three-year period, suspend for not exceeding a three-year period or expel a member as the findings warrant. A member may be cited to appear before it by the Board of Trustees or Committee on Ethics and Censorship to answer charges or complaints of unethical or unprofessional conduct. Upon the final conviction of any member of an offense amounting to a felony under the law applicable thereto, such member shall automatically be deemed expelled from membership in this Association; a conviction shall be deemed final for the purposes hereof when affirmed by an appellate tribunal of final jurisdiction or upon expiration of the period allowed for appeal.

If a member shall have been suspended or expelled from a divisional society because of a breach of the Code of Ethics by proper action of such divisional society, the Board of Trustees of this Association shall review the record of such decision. The decision may first be referred to the Committee on Ethics and Censorship for recommendations. If the Board of Trustees shall concur in the action of the divisional society, such member shall be suspended for the same period of time or expelled from this Association upon the same basis as in the decision of the divisional society.

The Board of Trustees is authorized to adopt and amend from time to time in the manner directed by the Board a Guide for Administrative Procedure regulating the procedure applicable to matters involving violations of the Code of Ethics.

Article X—Departments, Bureaus, Committees, and Sections

(The following proposed amendments are published at the request of the Executive Secretary. They are presented because amendments adopted in 1955 interpose a sentence between a pronoun and its antecedent.)

Amend Section 1 by deleting the first word of the third sentence, "It," and substituting therefor the words "The Department." The sentence would then read: "The Department (of Professional Affairs) shall have general supervision over all Association activities directed toward the profession and shall be charged with the investigation, classification, and recognition of the colleges of osteopathy and shall report thereon to the Trustees, and shall perform such other duties as may be fixed by the Trustees."

Amend Section 2 by deleting the first word of the third sentence, "It," and substituting therefor the words "The Department." The sentence would then read: "The Department (of Public Affairs), shall have general supervision of all the Association activities directed toward the public and such other duties as may be fixed by the Trustees."

(The following proposed amendment is published at the direction of the Board of Trustees and, if adopted, would change the name of the Division of Public and Professional Welfare.)

Amend Section 2 by deleting the last word in the first sentence, "Welfare," and substituting therefor the word "Service."

Further amend Section 2 by deleting in paragraph three of the section, the word "Welfare" and substituting therefor the word "Service." The paragraph would then read:

"The Division of Public and Professional Service shall be composed of a chairman (approved in the regular manner by the Board of Trustees), the President, and the Executive Secretary, who shall constitute an Executive Committee of the Division, and of such others as shall from time to time be selected. This Division shall perform the duties previously set forth by the Board of Trustees and the House of Delegates and such other duties as shall from time to time be assigned to it."

(The following proposed amendments are published at the direction of the Board of Trustees and, if adopted, would change the name of the present Bureau of Conventions.)

Amend Section 1 by adding in the first sentence after the word "Conventions," the words "and Meetings." The sentence would then read:

"The Department of Professional Affairs shall include the Bureaus of Professional Education and Colleges, Hospitals, Conventions and Meetings, Professional Development, and Research. Committees may be established by the House of Delegates or the Board of Trustees so as to carry out efficiently the work of the various bureaus as outlined by the House of Delegates and/or the Board of Trustees."

Amend Section 6 by adding after the word "Conventions," wherever it appears in the section, the words "and Meetings."

(The following proposed amendment is published at the direction of the Board of Trustees. It would delete present provisions for the duties of officers of Sections, not now included in the annual convention program.)

Amend Section 6 by removing the second paragraph which reads as follows:

"The first chairman, vice-chairman and secretary of a section shall be appointed by the Board of Trustees. Thereafter at each annual meeting each section maintaining a minimum membership of twenty shall elect its own officers. The final confirmation of these officers shall be subject to approval by the Board of Trustees. The chairman, in addition to his usual duties, shall prepare the program for his section and submit it to the Bureau of Conventions at least three months before the date of the next annual meeting of the Association. The vice-chairman shall perform the duties of the chairman in his absence or failure. The secretary shall maintain a membership list as provided for in this section which shall at all times be available to the A.O.A. Secretary and to the sectional program chairman."

(The following proposed amendment is published as an alternative to the immediately preceding amendment and would delete from the Bylaws all references to Sections while still leaving in the Constitution the provision for setting up Sections if in the wisdom of the House it should later become desirable to reconstitute Sections.)

Amend Section 6 by deleting the entire section which reads as follows:

"Sec. 6. On petition of not less than twenty regular members of the Association, and after approval by the Bureau of Conventions, the Board of Trustees may authorize a section on any subject relating to the science or art of osteopathy. The persons whose names appear on such petition, with those who may register with the secretary at the beginning of the annual meeting, shall constitute the members of the section. Those who have registered for any section at any annual meeting shall constitute the membership of that section for the ensuing year. No member shall register for more than two sections.

"The first chairman, vice-chairman and secretary of a section shall be appointed by the Board of Trustees. Thereafter at each annual meeting each section maintaining a minimum membership of twenty shall elect its own officers. The final confirmation of these officers shall be subject to approval by the Board of Trustees. The chairman, in addition to his usual duties, shall prepare the program for his section and submit it to the Bureau of Conventions at least three months before the date of the next annual meeting of the Association. The vice-chairman shall perform the duties of the chairman in his absence or failure. The secretary shall maintain a membership list as provided for in this section which shall at all times be available to the A.O.A. Secretary and to the sectional program chairman.

"Each section shall meet at the time of the annual meetings of the Association, and shall hold two or more sessions for formal programs, as may, in the judgment of the Bureau of Conventions, be deemed most practicable."

(The following proposed amendment is published at the request of the Executive Secretary to provide for the proper designation of Article X, in the event the immediately preceding amendment is adopted.)

Further amend Article X by deleting in the title of the article the words "and Sections" and by inserting the word "and" before the word "Committees." The title of Article X would then read: "Departments, Bureaus, and Committees."

American Osteopathic Association

ADVANCE APPLICATION FORM

60th Annual Convention—New York

July, 1956

NEW YORK CONVENTION REGISTRATION—July 16 to July 20, inclusive:

Member of American Osteopathic Association	$20.00	.....
Adult Guest (Name)	$20.00	.....
Juvenile Guest (under 18 years) (Name)	No Fee	.....
Others		.....
Total		$.....

PHILADELPHIA INSTRUCTION COURSES—July 9 to July 14, inclusive:
(Registration for New York Convention is required of all who register for any of the Philadelphia Instruction Courses.)

Indicate Choice (1st, 2nd and 3rd)	Philadelphia Instruction Courses	New York Convention Registration	Total	
Special Course No. 1—Proctology	$125.00	$20.00	$145.00	.....
Special Course No. 2—Cardiac Auscultation	50.00	20.00	70.00	.....
Special Course No. 3—Cardiac Arrest and Resuscitation	50.00	20.00	70.00	.....
Special Course No. 4—Electrocardiography for Anesthesiologists	75.00	20.00	95.00	.....
Special Course No. 5—The Vertebral Column—Developmental and Acquired Abnormalities	50.00	20.00	70.00	.....
Total				$.....

Name .....

..... (Street Address) ..... (City) ..... (Zone) ..... (State)

This space for A.O.A. Central Office use, only:

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REGISTRATION FEES

NEW YORK CONVENTION REGISTRATION—July 16 to July 20, inclusive:

Member of American Osteopathic Association	$20.00
Adult Guests	$20.00
*Juvenile Guests (under 18 years)	No Fee
*Students, including Interns & Residents	No Fee
*Wives of Students	No Fee
Non-members, but eligible	**$75.00 (in addition to 20.00 including tax)
Non-members, ineligible	**$25.00 (in addition to 20.00 including tax)

*Individual tickets for entertainment events may be purchased.

**See Registration Rules on this page.

PHILADELPHIA INSTRUCTION COURSES—July 9 to July 14, inclusive:

(Registration for the New York Convention is required of all who register for any of the Philadelphia Instruction Courses.)

	Philadelphia Instruction Courses	New York Convention Registration	Total
Special Course No. 1—Proctology	$125.00	$20.00	$145.00
Special Course No. 2—Cardiac Auscultation	50.00	20.00	70.00
Special Course No. 3—Cardiac Arrest and Resuscitation	50.00	20.00	70.00
Special Course No. 4—Electrocardiography for Anesthesiologists	75.00	20.00	95.00
Special Course No. 5—The Vertebral Column—Developmental and Acquired Abnormalities	50.00	20.00	70.00

REGISTRATION RULES—1956

NEW YORK CONVENTION REGISTRATION—July 16 to July 20, inclusive:

Those who may register are: members of the Association, their children, and their adult guests who are not osteopathic physicians; osteopathic students; osteopathic students' wives; commercial and scientific exhibitors.

Osteopathic physicians who are not members of the Association, but appear to be eligible for membership will pay a fee of $75.00 in addition to the $20.00 convention registration fee. Such doctors may thereupon apply for membership at the registration desk, and their $75.00 fee will be applied to their annual dues. All such applications will be put through the regular channels. If the applicant is not acceptable, $50.00 of the $75.00 will be returned and the remainder retained as the registration fee charged non-members.

Osteopathic physicians not eligible for membership in the Association may register for the Convention, but only upon the presentation of official, written evidence of current membership in a divisional society of the Association. Such doctors must pay a fee of $25.00 in addition to the $20.00 convention registration fee.

PHILADELPHIA INSTRUCTION COURSES—July 9 to July 14, inclusive:

(Registration for the New York Convention is required of all who register for any of the Philadelphia Instruction Courses.)

Special Course No. 1—Proctology: Enrollment limited to 8. July 9-13, inclusive. A comprehensive forty-hour course in proctology which includes the anatomy, physiology, pathology, methods of diagnosis and treatment of diseases of the anus and rectum. Didactic lectures are supplemented with clinical work in the hospitals and out-patient departments.

Special Course No. 2—Cardiac Auscultation: Enrollment limited to 25. July 9 and 10.
A two day course designed to familiarize the practicing physician with the types of heart disease where the important findings are present on physical examination. Auscultation of the heart is studied under ideal conditions by use of the educational cardioscope whereby each student and the instructor listens at the same time to each patient.

Special Course No. 3—Cardiac Arrest and Resuscitation: Enrollment limited to 12. July 11, only.
A one day course designed for surgeons, anesthesiologists and physicians interested in the subject of Cardiac Arrest. A detailed discussion of the physiological and pharmacological principles as well as a practical working experience in the resuscitation of the acutely arrested heart will be presented. In addition to cadavers, live dogs will be used under the management of guest faculty experienced in animal anesthesia and surgery.

Special Course No. 4—Electrocardiography for Anesthesiologists: Enrollment limited to 25. July 12-14, inclusive.
A three day course designed to familiarize anesthesiologists with the basic physiology of the heart, certain aspects of electrocardiography and the effect of the various agents upon the heart and the electrocardiogram. Several sessions are given in the operating room where operations are monitored on the operation room cardioscope.

Special Course No. 5—The Vertebral Column—Developmental and Acquired Abnormalities: Enrollment limited to 25. July 12 and 13.
A two day course of intensive study of the developmental and acquired abnormalities of the vertebral column. The course will include discussions of the following: developmental anatomy, radiologic anatomy, clinical evaluation, methodology of examination, traumatic mechanisms, scoliosis, infections, disc lesions, postural states, degenerative states and neoplastic diseases.

METHOD OF ASSIGNMENT TO PHILADELPHIA INSTRUCTION COURSES:

The Philadelphia College of Osteopathy, will, insofar as possible, consider each applicant on the basis of: (1) eligibility and (2) the date of receipt of application. The Philadelphia College of Osteopathy will be the sole judge of the eligibility of each applicant for enrollment in the course of choice.

See page 610 for course fees

SUMMARY OF INSTRUCTIONS

1—Complete Advance Registration Blank.

2—Designate 1st, 2nd, and 3rd choice of Philadelphia Instruction Courses, if application is made for same.

3—Give names of adult guests and juvenile guests (under 18 years).

4—Latest date for receipt of registration blanks applying for enrollment in Philadelphia Instruction Courses is June 1, 1956.

5—Make check payable to:
Treasurer—American Osteopathic Association

6—Mail Advance Registration Blank and check to:
American Osteopathic Association
Bureau of Conventions
212 East Ohio Street
Chicago 11, Illinois

HOMETOWN NEWS RELEASE

Fill out this form if you wish a news release sent to your hometown newspaper during your attendance at the New York Convention.

No release will be sent unless this form is completely filled out

NAME .....

STREET ADDRESS.....

CITY .....ZONE.....STATE.....

NAME OF ORGANIZATION.....

NAME OF GUESTS.....

NAME OF HOME-TOWN NEWSPAPER (for metropolitan areas, please give name of local community newspaper) .....

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60th Annual Convention—American Osteopathic Association

Hotel Statler—New York—July 16-20, 1956

HOTEL RATES*

All Accommodations at The Hotel Statler, New York

Single Rooms	$ 7.50 to $12.00
Double Rooms	$10.50 to $15.00
Twin Bedrooms	$11.50 to $18.00
Studio Rooms	$17.00 to $19.00
Suites	$31.00 and up

*Hotel rates are subject to 5% city occupancy tax. Rates listed are subject to change. Single Rooms are limited in number.

IMPORTANT: Please read these instructions before filling out application blank.

1—All reservations must be made directly to The Hotel Statler, prior to June 20, 1956.

2—Do not send reservations to the Local Convention Committee or to the American Osteopathic Association Central Office.

3—Classifications of eligible applicants for hotel accommodations are: Member, Officer, Trustee, Delegate, Alternate, Scientific or Technical Exhibitor.

(See Hotel Reservation Blank on Next Page)

APPLICATION FOR HOTEL ACCOMMODATIONS

Must be received prior to June 20, 1956

Convention of the American Osteopathic Association

New York—July 16-20, 1956

Date.....

The Hotel Statler
7th Avenue at 33rd Street
New York 1, New York

ACCOMMODATIONS DESIRED

Single Room.....Double Room.....Twin Bedroom.....Studio Room.....Suite.....

Arrival: Date.....Hour.....Departure: Date.....Hour.....

NAME OF GUESTS

Please list the name and address of each person for whom you are requesting reservations and who will occupy the accommodations.

Name.....Address.....

Name.....Address.....

Name.....Address.....

Signature of Person Requesting Reservations:

Name.....

Address.....City.....Zone.....State.....

Name of Firm (if technical exhibitor).....

All Reservations Must Be Received Prior to June 20, 1956

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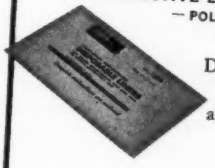

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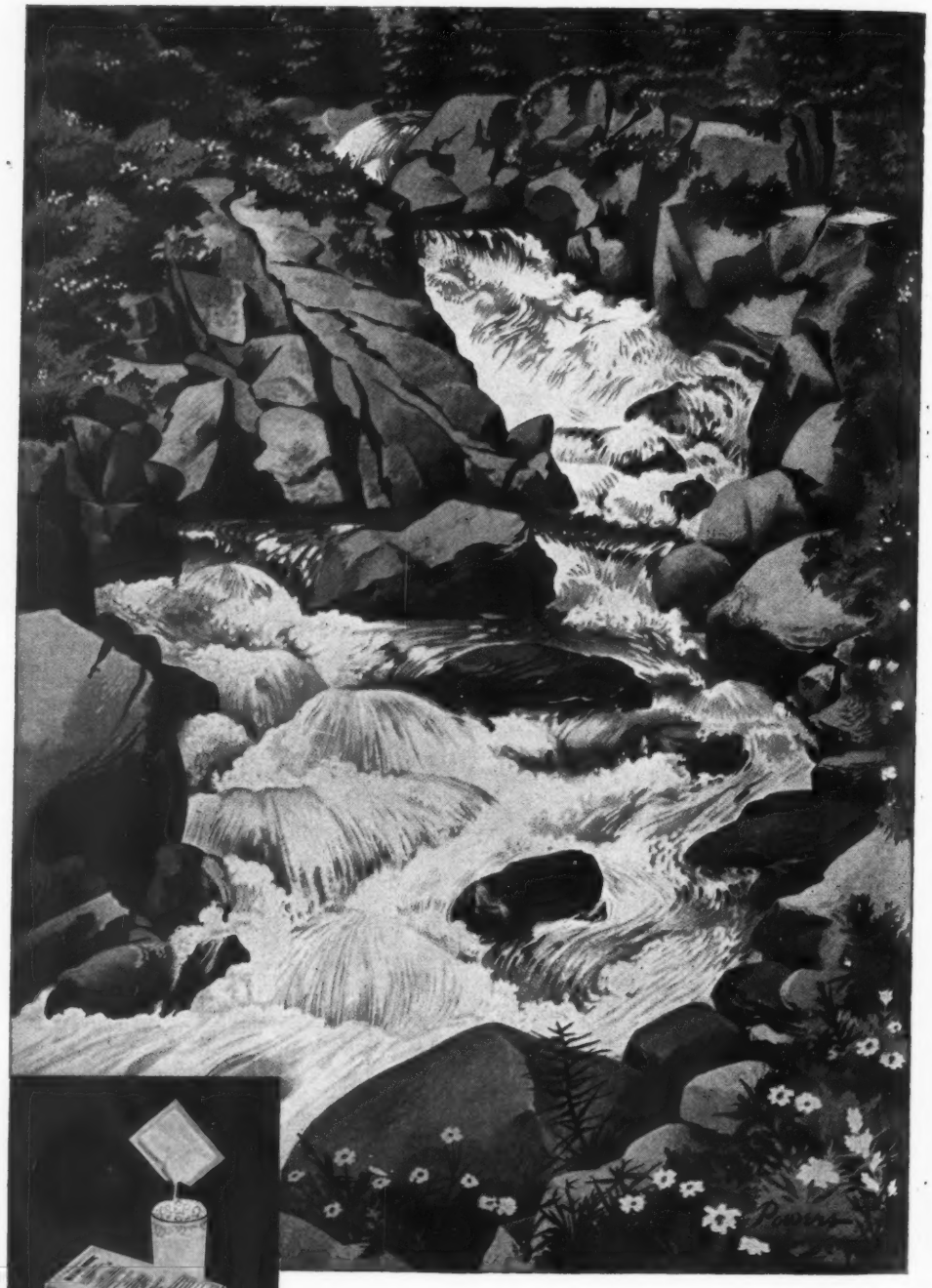

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Average Dosage: 3 Effervescent Packets; 3 tablespoonfuls Emulsion; or 15 Tablets: (three times daily at mealtimes).
Supplied: Effervescent Packets (new) — 24's; Emulsion — 16 fl.oz.; Tablets — 200's.
1. Hirsch, S.: New York J. Med. *55:1170* (April 15) 1955. 2. Dixon, H. H.; and others: West. J. Surg. *60:327* (July) 1952).

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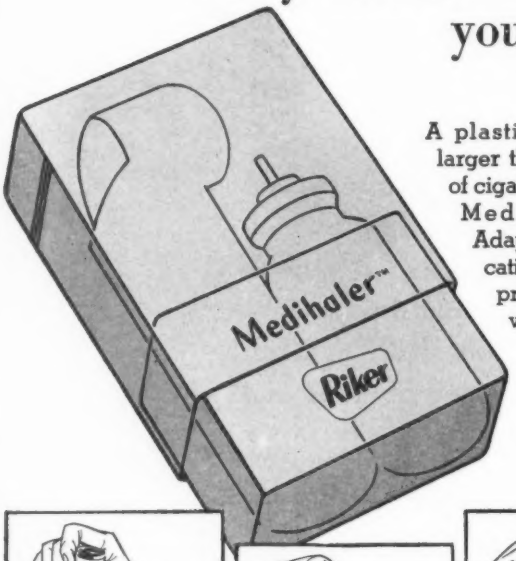

A plastic case, little larger than a package of cigarettes, contains Medihaler Oral Adapter and medication* (in shatterproof, spillproof vial).

Insert valve of medication vial snugly into Adapter.

Hold as shown, close lips around Adapter, and inhale while pressing vial down against Adapter.

Package is conveniently carried in pocket or purse. Inconspicuous, notably safe, dependable.

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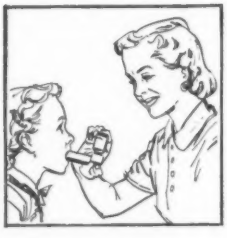

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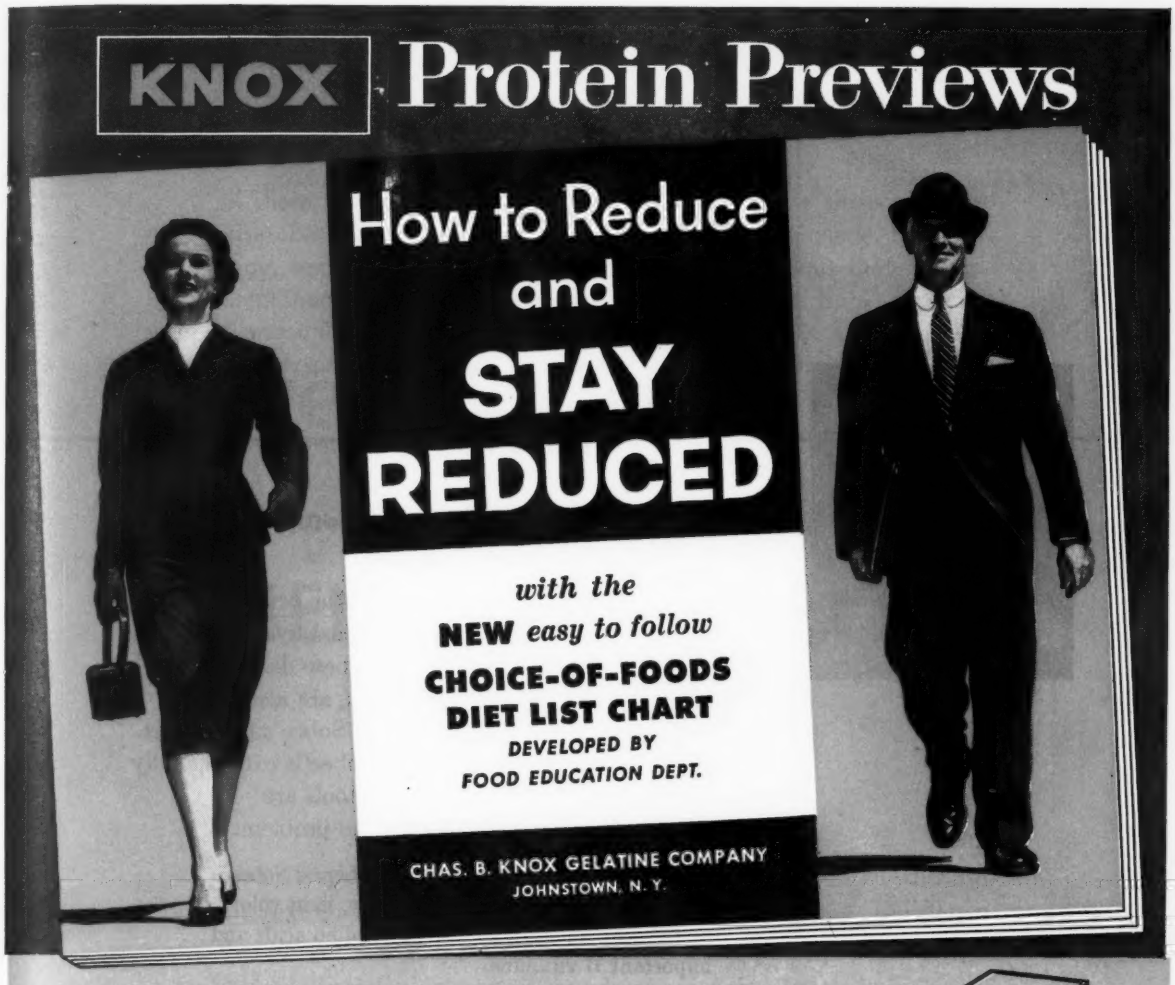

New Booklet Available to Aid Management of Overweight Patients

The 1955 edition of the well-known Knox "Eat-and-Reduce" booklet eliminates calorie counting for your obese patients. This year's edition is based on the use of Food Exchange Lists[1] which have proved so accurate in the dietary management of diabetics. These lists have been adapted to the dietary needs of patients who must lose weight.

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To help patients persevere in their reducing plans, the last 14 pages of the new Knox booklet are devoted to more than six dozen *tested*, low-calorie recipes. Please use the coupon below to obtain copies of the new "Eat-and-Reduce" booklet for your practice.

1. Developed by the U. S. Public Health Service assisted by committees of The American Diabetes Association, Inc. and The American Dietetic Association.

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Satisfactory growth and nutrition . . . 99% relief of eczema, 90% relief of gastrointestinal and/or non-dermatologic symptoms . . . excellent acceptance.

*From an exhibit by Sydney H. Kane, M.D., at the American Medical Association meeting, Atlantic City, N. J., June 6-10, 1955.

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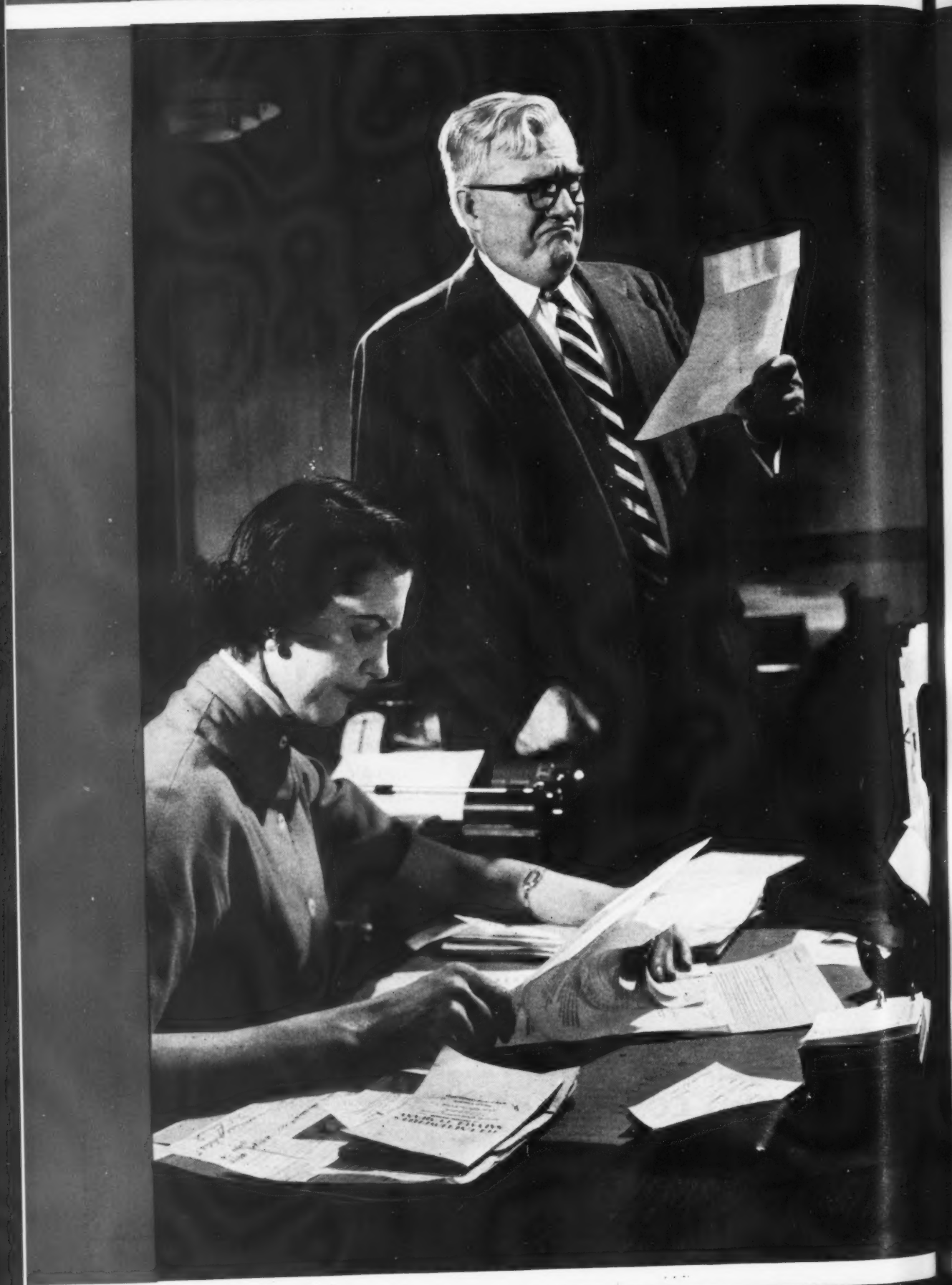

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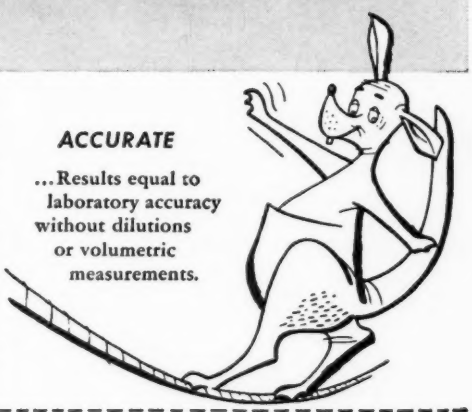

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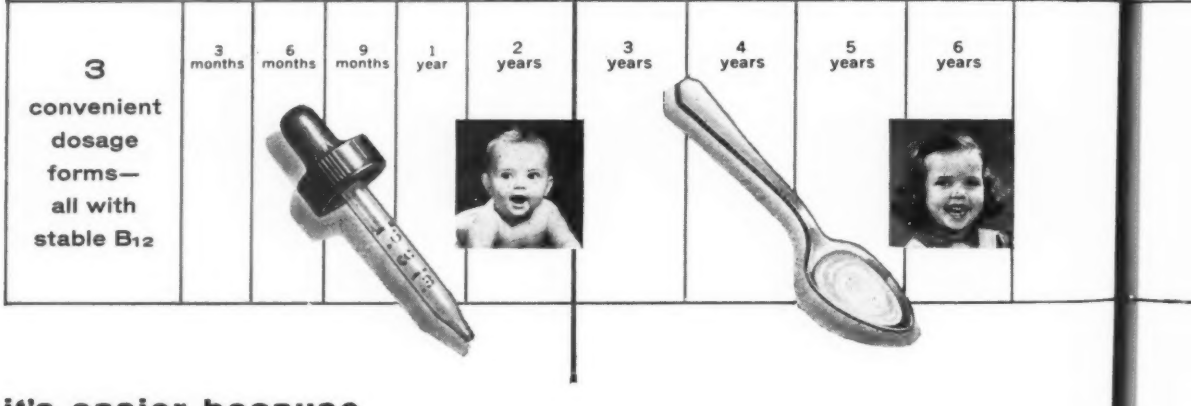

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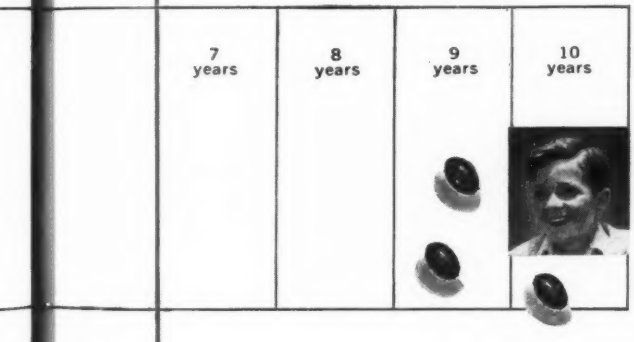

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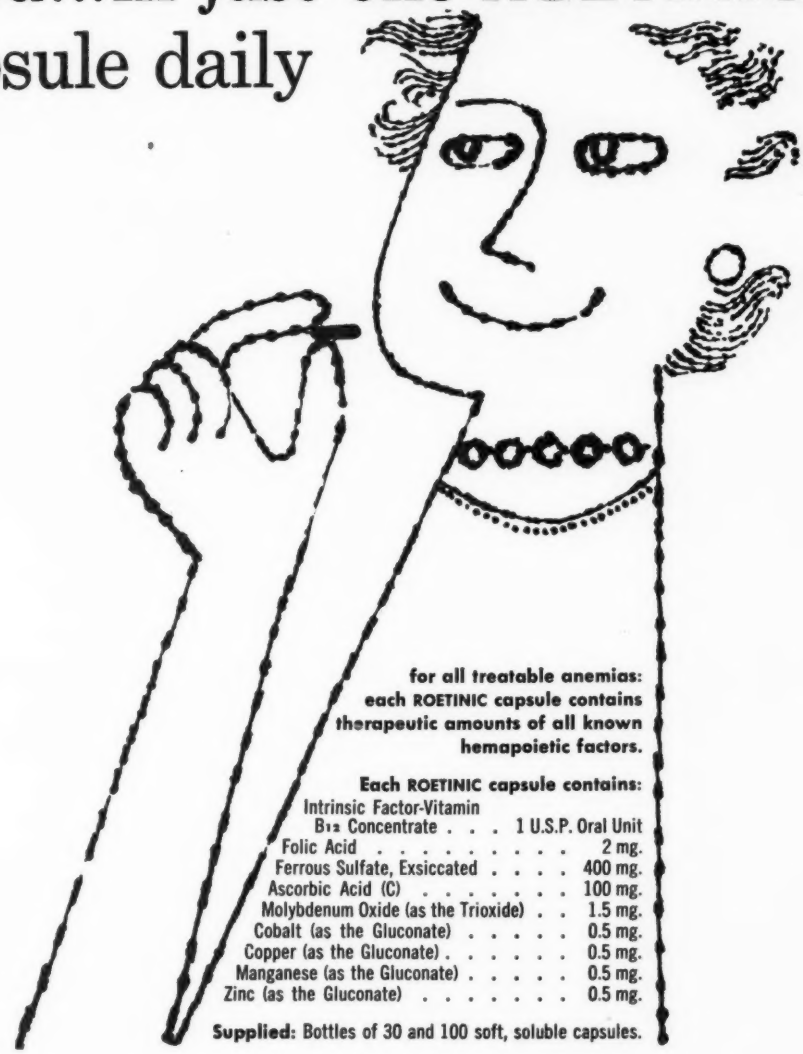

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Ascorbic Acid (C)	100 mg.
Molybdenum Oxide (as the Trioxide)	1.5 mg.
Cobalt (as the Gluconate)	0.5 mg.
Copper (as the Gluconate)	0.5 mg.
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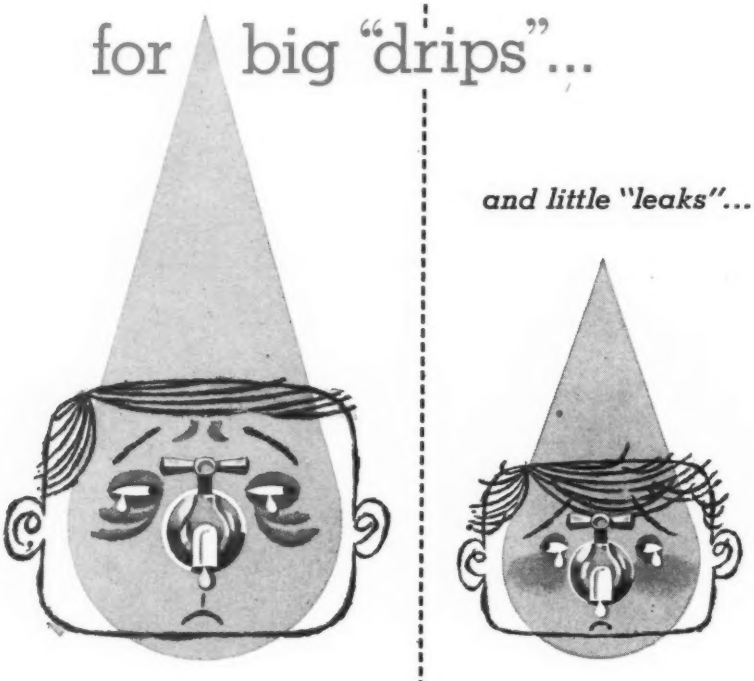

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Conventions and Meetings

Announcements

American Osteopathic Association, Sixtieth Annual Convention, Hotel Statler, New York City, July 16-20. Program Chairman, Myron C. Beal, 17 Vick Park A., Rochester 7, N. Y.

Academy of Applied Osteopathy, annual meeting, Hotel Statler, New York City, July 20-21. Program Chairman, Margaret H. Raffa, 5009 Central Ave., Tampa 3, Fla. Secretary, Margaret W. Barnes, Box 1345, Carmel, Calif.

American College of General Practitioners in Osteopathic Medicine and Surgery, annual meeting, New York City, July 16. Secretary, Alfred J. Schramm, 5880 San Vicente Blvd., Los Angeles 19.

American College of Neuropsychiatrists, annual meeting, Hotel Statler, New York City, July 13-15. Secretary, Don C. Littlefield, 4320 Atlantic Ave., Long Beach 7, Calif.

American College of Osteopathic Internists, annual meeting, Muehlebach Hotel, Kansas City, Mo., October 4-6. Program Chairman, Richard DeNise, 720-22 Sixth Ave., Des Moines 9, Iowa. Secretary, Glennard E. Lahrson, 460 Staten Ave., Oakland 10, Calif.

American College of Osteopathic Pediatricians, annual meeting, Hotel Statler, New York City, July 12-14. Secretary, Harold H. Finkel, 248 W. Main St., Ephrata, Pa.

American College of Osteopathic Surgeons, annual meeting, Sheraton-Cadillac Hotel, Detroit, October 28-November 1. Secretary, Orel F. Martin, Box 474, Coral Gables 34, Fla.

American Osteopathic Academy of Geriatrics, annual meeting, Hotel Statler, New York City, July 18-20. Secretary, John K. Johnson, Jr., Johnson Osteopathic Clinic, West on Lincoln Highway, Jefferson, Iowa.

American Osteopathic Academy of Orthopedics, annual meeting, Sheraton-Cadillac Hotel, Detroit, October 28-November 1. Secretary, J. Paul Leonard, 2673 W. Grand Blvd., Detroit 8.

American Osteopathic College of Anesthesiologists, annual meeting, Sheraton-Cadillac Hotel, Detroit, October 28-November 1. Secretary, Crawford M. Esterline, Box 155, Kirksville, Mo.

American Osteopathic College of Ophthalmology and Otorhinolaryngology, annual meeting, Hotel Statler, Cleveland, July 25-27. Program Chairman, H. I. Stein, 3025 W. Diamond St., Philadelphia 21. Executive Secretary, Clifford C. Foster, 1388 Gladys Ave., Lakewood 7, Ohio.

American Osteopathic College of Pathologists, annual meeting, Hotel Statler, New York City, July 16-17. Secretary, Arthur L. Wickens, Mount Clemens General Hospital, Macomb at North, Mount Clemens, Mich.

American Osteopathic College of Physical Medicine and Rehabilitation, annual meeting, Hotel Statler, New York City, July 15. Secretary, John A. Schuck, 1721 Griffin Ave., Los Angeles 31.

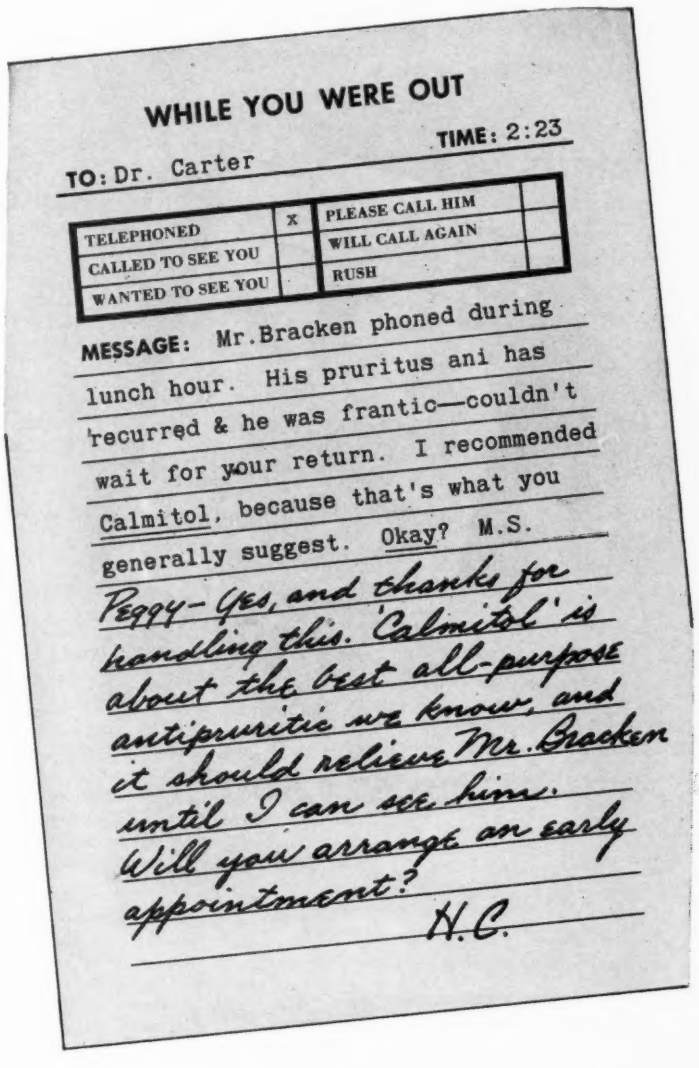
American Osteopathic College of Radiology, annual meeting, Sheraton-Cadillac Hotel, Detroit, October 28-November 1. Program Chairman, George B. Hylander, West Side Osteopathic Hospital, 1253 West Market St., York, Pa. Secretary, F. A. Turfler, Jr., South Bend Osteopathic Hospital, 118 S. William St., South Bend 2, Ind.

American Osteopathic Hospital Association, annual meeting, Sheraton-Cadillac Hotel, Detroit, October 28-November 1. Program Chairman, Mr. Philip Rosenthal, Metropolitan Hospital, Philadelphia. Secretary, Mrs. Byron Axtell, Princeton, Mo.

Florida, annual meeting, Fort Harrison Hotel, Clearwater, May 17-19. Program Chairman, Paul E. Wilson, 802 E. Ocklawaha Ave., Ocala. Secretary, Dominic Raffa, 5009 Central Ave., Tampa 3.

Idaho, annual meeting, Owyhee Hotel, Boise, May 18-20. Program Chairman, L. J. Anderson, 308 Eastman Bldg., Boise. Secretary, Emery J. Miller, 124-28 Caldwell Blvd., Nampa.

Indiana, annual meeting, Notre Dame University and Morris Inn, South Bend, May 13-15. Program Chairman, A. F. Kull, South Bend Osteopathic Hospital, 118 S. William St., South Bend 2. Secretary, Arabelle Baker


WHILE YOU WERE OUT
TO: Dr. Carter
TIME: 2:23
TELEPHONED
CALLED TO SEE YOU
WANTED TO SEE YOU
PLEASE CALL HIM
WILL CALL AGAIN
RUSH
MESSAGE: Mr. Bracken phoned during lunch hour. His pruritus ani has recurred & he was frantic—couldn't wait for your return. I recommended Calmitol, because that's what you generally suggest. Okay? M.S.
Peggy—Yes, and thanks for handling this. 'Calmitol' is about the best all-purpose antipruritic we know, and it should relieve Mr. Bracken until I can see him. Will you arrange an early appointment?
H.C.

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Iowa, annual meeting, Hotel Savery, Des Moines, May 20-22. Program Chairman, Clive R. Ayers, Grant. Secretary, Mr. Herman W. Walter, 200 Walnut Bldg., Des Moines 9.

Kansas, annual meeting, Baker Hotel, Hutchinson, May 12-16. Program Chairman, B. L. Darling, Osteopathic Clinic, 1404 Main St., Winfield. Executive Secretary, Mr. Lloyd L. Hall, Room 612, National Bank of Topeka Bldg., Topeka.

Kentucky, annual meeting, Brown Hotel, Louisville, October 10-11. Program Chairman, Charles R. Conley, 300 Main St., Greenup. Secretary, Martha Garnett, 2829 Brownsboro Road, Louisville 6.

Maine, annual meeting, Samoset Hotel, Rockland, June 14-16. Professional Education Chairman, Richard Wallace, Hollis Center. Midyear meeting, Elmwood Hotel, Waterville, December 7-8. Secretary, Roswell P. Bates, 72 Main St., Orono.

Michigan, annual meeting, Pantlind Hotel, Grand Rapids, October 1-3. Program Chairman, George E. Himes, Flint Osteopathic Hospital, 416 W. Fourth Ave., Flint 4. Executive Secretary, Mr. Harve Lamont Smith, 81 Glendale, Highland Park 3.

Missouri, annual meeting, Hotel Jefferson, St. Louis, October 9-11. Program Chairman, R. A. Michael, 209 Monroe St., Jefferson City. Executive Secretary, Mr. Paul D. Adams, 325 E. McCarty St., Jefferson City.

New York, annual meeting, Hotel Utica, Utica, October 12-13. Program Chairman, Allen S. Prescott, 800 Keith Bldg., Syracuse 2. Secretary, C. Fred Peckham, 27 W. Bridge St., Oswego.

North Carolina, annual meeting, Battery Park Hotel, Asheville, October 25-27. Program Chairman and Secretary, S. Dales Foster, 710 Public Service Bldg., Asheville.

Northwest Osteopathic Convention, Chinook Hotel, Yakima, Wash., June 25-27. Program Chairman, Wilbert B. Saunders, 4730 University Way, Seattle 5.

Oklahoma, annual meeting, Biltmore Hotel, Oklahoma City, November 7-9. Program Chairman, Melvin A. Kiesel, Hinton Community Hospital, Hinton. Executive Secretary, Mr. Walter L. Gray, 210-212 Braniff Bldg., Oklahoma City.

Oregon: See Northwest Osteopathic Convention.

Pennsylvania, midyear meeting, Yorktown Hotel, York, April 27-28; annual meeting, Bellevue Stratford Hotel, Philadelphia, September 21-23. Program Chairman for both meetings, William L. Silverman, 117 Merion Rd., Merion. Secretary, Thomas F. Santucci, 2140 S. Broad St., Philadelphia 45.

South Dakota, annual meeting, Cataract Hotel, Sioux Falls, June 10-12. Program Chairman, L. H. Shoraga, Alcester. Secretary, Earl W. Hewlett, 417 W. 27th St., Sioux Falls.

Utah, annual meeting, Ambassador Athletic Club, Salt Lake City, June 23. Program Chairman, Wilford G. Hale, 506 West 2nd South, Logan. Secretary, Alice E. Houghton, 600 Zion's Savings Bank Bldg., Salt Lake City 11.

Vermont, annual meeting, Hotel Vermont, Burlington, October 5-7. Program Chairman, Bentley Neal, White River Junction. Clerk, Howard I. Slocum, Battell Block, Middlebury.

Virginia, annual meeting, The Lodge, Williamsburg, May 25-26. Program Chairman, Vincent H. Ober, 407-11 Bankers Trust Bldg., Norfolk 10. Secretary, John A. Cifala, 2778 N. Washington Blvd., Arlington.

Washington: See Northwest Osteopathic Convention.

West Virginia, annual meeting, Daniel Boone Hotel, Charleston, June 2-5. Program Chairman, Walter B. Goff, 429 16th St., Dunbar. Secretary, Guy E. Morris, 542 Empire Bank Bldg., Clarksburg.

Western States Osteopathic Society of Proctology, annual meeting, Mayo Hotel, Tulsa, Okla., October 8-10. Program Chairman, Glenn Miller, 2100 N. Robinson St., Oklahoma City 3. Secretary, Earle F. Waters, 925 E. South Temple St., Salt Lake City 2.

State and National Boards

ALABAMA

Examinations June 26-29 at the State Capitol, Montgomery. Address D. G. Gill, M.D., secretary, Board of Medical Examiners, State Office Bldg., Montgomery 4.

ARIZONA

Those interested in professional examinations should contact Russell Peterson, D.O., secretary, Osteopathic Board of Registration and Examination in Medicine and Surgery, 2747 East McDowell Road, Phoenix.

Basic science examinations June 19 at the University of Arizona, Tucson. Applications must be filed 2 weeks prior to the examination. Address Herbert D. Rhodes, Ph.D., secretary, Basic Science Board, University of Arizona, Tucson.

COLORADO

Professional examinations June 12-13 at Denver. Applications must be filed by May 14. Address Mrs. Beulah H. Hudgens, executive secretary, Board of Medical Examiners, 831 Republic Bldg., Denver 2.

CONNECTICUT

Professional examinations July 10-11. Applications must be filed 2 weeks prior to examination. Address Frank Poglitsch, D.O., secretary, Osteopathic Examining Board, 300 Main St., New Britain.

Basic science examinations June 9 in Room 23, Lampson Hall, Yale University, New Haven. Applications must be filed 2 weeks prior to examination. Address Miss M. G. Reynolds, executive assistant, Board of Healing Arts, 52 Whitney Ave., New Haven 10.

DELAWARE

Examinations July 10-12. Address Joseph S. McDaniel, M.D., secretary, Board of Medical Examiners, 229 S. State St., Dover.

FLORIDA

Professional examinations June 30-July 1 at the Seminole Hotel, Jacksonville. Applications must be filed by June 1. Address W. S. Horn, D.O., secretary, Board of Osteopathic Medical Examiners, P.O. Box 85, Palmetto.

Basic science examinations June 9 at Miami. Applications must be filed by May 14. Address M. W. Emmel, D.V.M., secretary, Board of Examiners in the Basic Sciences, P.O. Box 340, Gainesville.

GEORGIA

Examinations July 3 at Atlanta. Address Robert K. Glass, D.O., secretary, Board of Osteopathic Examiners, 834-5 Forsyth Bldg., Atlanta 3.

IDAHO

Examinations June 14 at Boise. Address Miss Margaret Gilbert, Director, Occupational License Bureau, Department of Law Enforcement, State House, Boise.

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ILLINOIS

Examinations June 19-21 in Chicago. Address Mr. Frederic B. Selcke, Superintendent of Registration, Department of Registration and Education, State House, Springfield.

INDIANA

C. Allen Brink, D.O., Princeton, has been elected treasurer of the Board of Medical Registration.

IOWA

Basic science examinations July 10 at the Capitol Bldg., Des Moines. Address Ben H. Peterson, Ph.D., secretary, Board of Basic Science Examiners, Coe College, Cedar Rapids.

KANSAS

Examinations June 21 at the Jayhawk Hotel, Topeka. Applications must be filed 30 days prior to examination. Address Forrest H. Kendall, D.O., secretary, Board of Osteopathic Examination and Registration, 420½ Pennsylvania Ave., Holton.

MAINE

Examinations June 12-13 at Augusta. Address George Frederick Noel, D.O., secretary, Board of Osteopathic Examination and Registration, Monument Square, Dover-Foxcroft.

MARYLAND

Examinations in June. Address Christopher L. Ginn, D.O., secretary, Board of Osteopathic Examiners, 419 No. Charles St., Baltimore 1.

MASSACHUSETTS

Examinations July 10. Address Robert C. Cochrane, M.D., secretary, Board of

Registration in Medicine, Room 37, State House, Boston 33.

MICHIGAN

Basic science examinations May 14-15 at Detroit and Ann Arbor. Address Mrs. Anne Baker, secretary, Board of Examiners in the Basic Sciences, 116 Mason Bldg., Lansing.

MINNESOTA

Basic science examinations June 5-6 at the University of Minnesota, Minneapolis. Applications must be filed by May 10. Address Raymond N. Bieter, M.D., secretary, Board of Examiners in the Basic Sciences, 105 Millard Hall, University of Minnesota, Minneapolis 14.

MISSISSIPPI

Examinations June 25-26 at the Edwards Hotel, Jackson. Applications must be filed by June 15. Address R. N. Whitfield, M.D., assistant secretary, Board of Health, Old Capitol, Jackson 5.

NEBRASKA

George P. Taylor, Sidney, has been appointed to the Osteopathic Board of Examiners for a term expiring November 30, 1958. He replaces Orville D. Ellis of Lincoln.

NEVADA

Professional examinations June 30. Applications must be filed 2 weeks prior to examination. Address Walter J. Walker, D.O., secretary, Board of Osteopathic Examiners, 210 W. Second St., Reno.

Basic science examinations July 3. Address Donald G. Cooney, Ph.D., secretary, Board of Examiners in the Basic Sciences, Box 9005, University Station, Reno.

NEW JERSEY

Examinations June 19. Address Patrick H. Corrigan, M.D., acting secretary, Board of Medical Examiners, 28 West State St., Trenton 8.

NEW MEXICO

Basic science examinations July 15. Address Mrs. Marguerite Cantrell, secretary, Board of Examiners in the Basic Sciences, P.O. Box 1522, Santa Fe.

NEW YORK

Examinations June 26-29 at Albany, Buffalo, Syracuse, and New York City. Applications must be filed by May 28. Address John W. Paige, M.D., chief, Bureau of Professional Examinations and Registrations, 23 S. Pearl St., Albany 7.

NORTH CAROLINA

Examinations July 2-3 at Raleigh. Applications must be filed by June 15. Address F. R. Heine, D.O., secretary, Board of Osteopathic Examination and Registration, 108 Kensington Rd., Greensboro.

NORTH DAKOTA

Examinations July 14 at Minot. Address G. L. Hamilton, D.O., secretary, Board of Osteopathic Examiners, Ringo Bldg., 119 S. Main St., Minot.

OHIO

Examinations June 14-16 at Columbus. Applications must be filed by June 1. Address H. M. Platter, M.D., secretary, Medical Board, 21 W. Broad St., Columbus 15.

ONTARIO

Examinations June 14-16 at Toronto. Applications must be filed by May 21. Address D. Gordon Campbell, D.O., secretary, Board of Directors of Osteopathy, Drugless Practitioners Act, Province of Ontario, 2 Bloor St. East, Toronto 5.

OREGON

Examinations in July at Portland. Address Mr. Howard I. Bobbitt, executive secretary, Board of Medical Examiners, 609 Failing Bldg., Portland 4.

RHODE ISLAND

Professional examinations July 5-6. Address Mr. Thomas B. Casey, Administrator of Professional Regulation, 366 State Office Bldg., Providence.

Basic science examinations May 16 in Room 366, State Office Bldg., Providence. Address Mr. Casey.

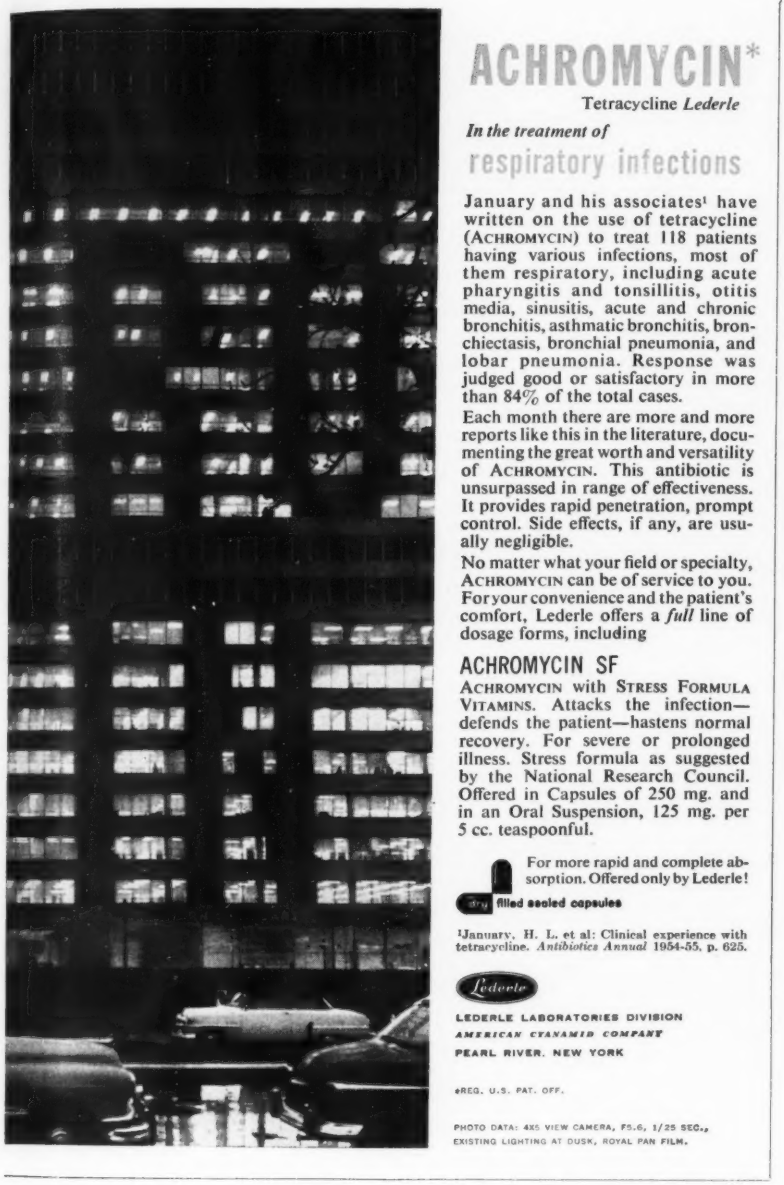
SOUTH CAROLINA

Examinations June 19 at Columbia. Address Ernest A. Johnson, D.O., secretary, Board of Osteopathic Examiners, Box 525, Summerville.

SOUTH DAKOTA

Professional examinations July 17-18 at Sioux Falls. Address Mr. John C. Foster, executive secretary, Board of Medical and Osteopathic Examiners, Room 300, First National Bank Bldg., Sioux Falls.

Basic science examinations June 8-9 at



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[1]January, H. L. et al: Clinical experience with tetracycline. *Antibiotics Annual* 1954-55, p. 625.

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Officers of the Board are: H. I. Slocum, Middlebury, president; J. Harry Spencer, St. Albans, treasurer; and Dr. Beale, secretary.

WASHINGTON

Professional examinations July 16-18 and basic science examinations July 11-12 at the School of Medicine, University of Washington, Seattle. Applications must be filed by June 29. Address Mr. Edward C. Dohm, secretary, Professional Division, Department of Licenses, Olympia.

WEST VIRGINIA

Examinations June 25-26 at the Daniel Boone Hotel, Charleston. Applications must be filed 10 days prior to examination. Applications for license by reciprocity must be filed 30 days prior to examination, and applicants must make a personal appearance. Address T. L. Sharpe, D.O., secretary pro tem., Board of Osteopathy, 212 W. Burke St., Martinsburg.

WISCONSIN

Professional examinations July 10 at Milwaukee. Address Thomas W. Tormey, Jr., M.D., secretary, Board of Medical Examiners, State Office Bldg., 1 W. Wilson St., Madison.

Basic science examinations June 2 at the Marquette University School of Medicine Auditorium, Milwaukee. Applications must be filed by May 25. Address Mr. William H. Barber, secretary, Board of Examiners in the Basic Sciences, 621 Ransom St., Ripon.

WYOMING

Examinations June 4 at Cheyenne. Address Franklin D. Yoder, M.D., secretary, Board of Medical Examiners, New State Office Bldg., Cheyenne.

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the Medicine and Science Building of the University of South Dakota, Vermillion. Applications must be filed by May 25. Address Gregg M. Evans, Ph.D., secretary, Board of Examiners in the Basic Sciences, 310 E. 15th St., Yankton.

TENNESSEE

Examinations August 8 at Nashville. Applications must be filed by July 15. Address M. E. Coy, D.O., secretary, Board of Examination and Registration for Osteopathic Physicians, 1226 Highland, Jackson.

TEXAS

Examinations June 18-20 at the Texas Hotel, Fort Worth. Applications for reciprocity must be filed 30 days prior, and applications for examinations must be filed 10 days prior to examination. Address M. H. Crabb, M.D., secretary, Board of Medical Examiners, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH

Alice E. Houghton and L. W. Shafer, both of Salt Lake City, have been reappointed to the Osteopathic Examining Board for terms expiring in 1957 and 1958, respectively.

VERMONT

Examinations June 20-21 at the State House, Montpelier. Applications must be filed by June 10. Address Charles D. Beale, D.O., secretary, Board of Osteopathic Examination and Registration, Mead Bldg., Rutland.

REREGISTRATION OF OSTEOPATHIC LICENSES

May 1—Iowa, $1.00. Address Mr. Herman W. Walter, assistant secretary, Board of Osteopathic Examiners, 200 Walnut Bldg., Des Moines 9.

May 1—Washington, $2.00. Address Mr. Edward C. Dohm, secretary, Professional Division, Department of Licenses, Olympia.

During June—Hawaii, $5.00 for residents, $2.00 for nonresidents. Address Frank O. Gladding, D.O., secretary, Board of Osteopathic Examiners, 504 Kauikeolani Bldg., Honolulu 48.

Before June 30—Delaware, $20.00. Address Joseph S. McDaniel, M.D., secretary, Board of Medical Examiners, 229 S. State St., Dover.

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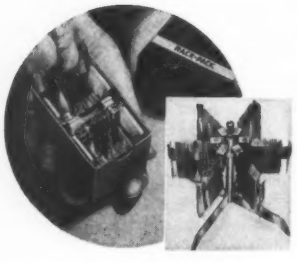

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June 30—Virginia, $1.00. Address K. D. Graves, M.D., secretary, Board of Medical Examiners, 631 First St., S.W., Roanoke.

July 1—Idaho, $10.00. Address Miss Margaret Gilbert, Director, Occupational License Bureau, Department of Law Enforcement, State House, Boise.

July 1—Kansas, $5.00. Address Forrest H. Kendall, D.O., secretary, Board of Osteopathic Examination and Registration, 420½ Pennsylvania Ave., Holton.

July 1—Michigan, $5.00. Address P. Ralph Morehouse, D.O., assistant secretary, Board of Osteopathic Registration and Examination, 214 S. Superior St., Albion.

July 1—New Mexico, $5.00. Address H. E. Donovan, D.O., secretary, Board of Osteopathic Examination and Registration, Donovan Osteopathic Hospital, Raton.

July 1—North Dakota, $3.00. Address G. L. Hamilton, D.O., secretary, Board of Osteopathic Examiners, Ringo Bldg., 119 S. Main St., Minot.

July 1—Oklahoma, $2.00. Address G. R. Thomas, D.O., secretary, Board of Osteopathy, 1100 N.W. 36th St., Oklahoma City 18.

July 1—West Virginia, $2.00. Address Theodore H. Lacey, D.O., secretary, Board of Osteopathy, 711½ Market St., Parkersburg.

Within 60 days after July 1—Indiana, $5.00 for residents, $10.00 for nonresidents. Address Ruth V. Kirk, executive secretary, Board of Medical Registration and Examination, 538 K. of P. Bldg., Indianapolis 4.

EXAMINATION BY NATIONAL BOARD

The National Board of Examiners for Osteopathic Physicians and Surgeons conducts Parts I and II of its examination on the first Thursday and Friday of each May and December at the six approved colleges. Application blanks may be obtained from the secretary or the dean of the college, and the completed application blank, together with a passport photograph and check for the parts to be taken, must be in the secretary's office by the November 1 or April 1 preceding the examination.

Examinations in Part I consist of anatomy, including histology and embryology; physiology; physiological chemistry; general pathology; and bacteriology, including parasitology and immunology.

Part II consists of examinations in surgery, including applied anatomy, surgical pathology, and surgical specialties; obstetrics and gynecology; pediatrics; neurology and psychiatry; public health, including hygiene, medical jurisprudence; osteopathic principles, therapeutics, including pharmacology and materia medica.

Part III is an oral and practical examination given under the supervision of a chief examiner who is a member of the Board and by a panel of associate examiners. Subjects covered in Part III are anatomy; physiology; pathology; osteopathic principles; therapeutics, and pharmacology; surgery; ophthalmology and otorhinolaryngology; obstetrics and gynecology; physical and clinical diagnosis; public health and communicable diseases.

These are oral examinations which the candidate may take after having satisfactorily completed the first 6 months of a 1 year internship in a hospital approved by the American Osteopathic Association for intern training. Part III is given annually at the Philadelphia, Kirksville, and Los Angeles colleges.

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pathic Association. The internship requirement does not apply to candidates who took Part I prior to July, 1950.

Application must be filed with the secretary of the Board not less than 30 days prior to the examination dates. Address Paul van B. Allen, D.O., secretary, 1512 N. Delaware Street, Indianapolis 2, Indiana.

EPIDEMIOLOGICAL TESTS OF THEORIES ON LUNG CANCER ETIOLOGY*

By William Haenszel†

Questions on the etiologies of lung cancer cannot be resolved by a single, decisive experiment or set of observations, and a single study is not the natural unit for discussing the epidemiology of this disease. The major concern must be with the interrelationships of findings and their collation to see whether a chain of evidence stronger than any single component part can be forged. Information on a proposed etiology cannot be assessed without relating it to both positive and negative findings on alternate possibilities, drawn from animal experimentation and other laboratory work as well as from epidemiological studies. Also, with a subject under such active scrutiny as lung cancer, it is difficult to attempt to divorce facts already established from interpretations which may either be stated explicitly or merely be implied by investigators through their choice of specific studies to be pursued. Under these conditions, a better perspective on epidemiological issues in lung cancer studies may be gained by viewing them in the perspective of possible future work. Since interrelationships of individual findings are the main concern, this paper deals more with the ideas underlying a set of studies than with the tactical details of any single study.

INCREASE IN LUNG CANCER

If no real increase in lung cancer existed, all associations between lung cancer and exposure to atmospheric pollution, cigarette smoking, or other exogenous agents recently introduced into the environment would be suspect as not pointing to possible etiological relationships. A few persons still maintain that the recorded increase in lung cancer incidence and mortality is fictitious and has resulted from improved diagnosis *(1)*, but this is no longer a popular position *(2)*. Among the reasons for accepting a real increase in lung cancer mortality are the sex differences in rate of increase and the magnitude of the current, continuing increase *(3)*.

One purpose for inquiries on the increase in risk would be to provide more precise quantitative estimates than are now available from mortality data which may later prove useful for reconciliation with numerical measures of exposure to suspected agents. For this reason, anyone proposing to study the effect of possible misdiagnosis of lung cancer as tuberculosis *(4)* or some other cause should relate these effects to data produced by the death registration system. Samples of deaths from lung cancer and other causes taken from vital statistics sources could be compared with autopsy protocols and other diagnostic evidence. Evaluation of the two sources of error in official statistics, *(a)* deaths from other causes erroneously recorded as lung cancer and *(b)* lung cancer deaths attributed to other causes, would be rendered difficult by the selective character of autopsy statistics. However, the effort should be made. A useful minimum objective would be to determine how many lung cancer cases remain undiagnosed at present. Farber reported that in a series of 1,070 morphologically proved cases of bronchogenic

*Reprinted from *Public Health Reports*, February, 1956.

†Mr. Haenszel is head of the Biometry Section, Biometry and Epidemiology Branch, National Cancer Institute, Public Health Service. He presented this paper at a joint session of the Biometrics Society and the Institute of Mathematical Statistics, Chapel Hill, N.C., April 23, 1955.

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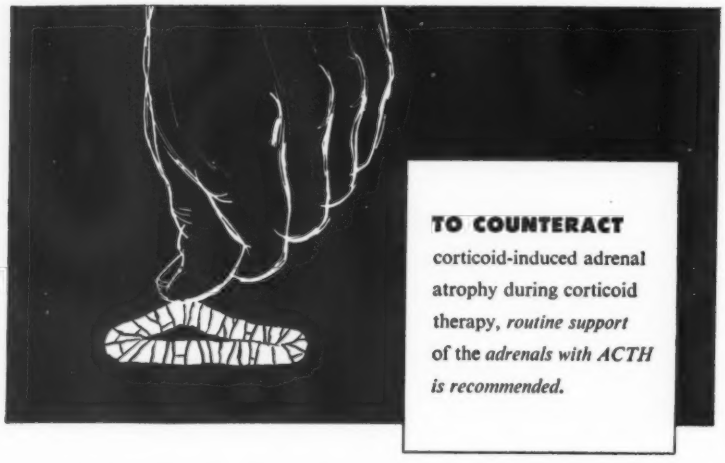

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carcinoma, 61 percent were not positively diagnosed prior to autopsy *(5)*. Undoubtedly, many of these deaths were not recorded as lung cancer on the death certificate.

ENVIRONMENTAL AGENTS

The working hypothesis for most investigators has been that the probable causes of lung cancer are to be found among environmental agents *(2)*. The association of the high prevalence of cancers for several other sites, particularly the mouth, with specific customs found only in certain parts of the world strengthens the belief that direct contact with known or suspected carcinogens may be involved *(6)*. On the assumption that agents with opportunity for direct contact with lung tissue are the most likely candidates, efforts to establish etiological relationships between lung cancer and environmental agents have been directed into three main areas: *(a)* airborne agents encountered in special occupations; *(b)* atmospheric pollutants, particularly those resulting from combustion of hydrocarbons; and *(c)* smoking of tobacco.

To assert that an agent is etiologically related to lung cancer simply implies that its removal from a defined population will result ultimately in a marked reduction of lung cancer. The population must be defined in a manner which safeguards against an effect being produced merely by the process of selection and classification. The concept does not require detailed specification of a mechanism producing the effect. Goldberger's finding that pellagra may be prevented by diet was no less valid because subsequent work led to the identification of the vitamin B complex and, finally, to nicotinic acid as the effective agent. This statement does not imply that ideas on mechanisms are not helpful; to the contrary, they may suggest situations in which data can be collected and tested.

OCCUPATIONAL CARCINOGENS

There is general agreement on the etiological significance of several occupational exposures, and such findings have been important in establishing the principle of multiple etiologies for lung cancer. Long-term observations of closed populations have convinced most people that the Schneeberg and Joachimsthal miners *(7, 8)* and certain groups of chromate workers *(9, 10)* were subjected, by virtue of their occupations, to excessive lung cancer risks. The evidence on chromate workers is purely epidemiological, not confirmed by animal experimentation, and was first suspected on the basis of clinical observations. Although many investigators have deduced from the Schneeberg and Joachimsthal observations that radiations emitted from radon were responsible, Lorenz felt that the case had not been firmly established and that other possibilities, such as dust pneumoconiosis, had not been conclusively ruled out *(11)*.

Excess lung cancer risks detected by examination of occupational mortality data, such as data on workers employed in the preparation of coal tar products and producer gas *(12)*, have also been generally accepted as reflecting an etiological relationship between lung cancer and some suspected carcinogenic agent in these products. Nor is there any great disposition to question the status of agents detected by clinical observations and retrospective studies of agents such as arsenic dust, nickel carbonyl, asbestos dust, and coke oven fumes *(13)*. When the study results are reviewed to pick up occupational exposures which appear repeatedly, the danger of being misled by a highly unusual result in a single study is minimized. Additional occupational risks will no doubt be demonstrated in the future. However, because of the small numbers of workers exposed, the further denumeration of very restricted types of risks will not be crucial in working out the epidemiological details of lung cancer. This statement would not apply to the common and widespread agents contributing to atmospheric pollution, including hydrocarbon combustion products such as industrial and heating plant wastes and motor vehicle exhausts.

ATMOSPHERIC POLLUTANTS

To date, atmospheric pollution theories have not been well documented by demonstrations of excess risk among workers with heavy exposures to common atmospheric pollutants such as may exist in railroad yards, oil refineries, and congested urban areas. With the advent of group insurance and pension plans, the methodological problems of such inquiries have become much simpler. Several co-

horts can be located for study. The National Cancer Institute is following a group of 1,100,000 railroad employees who have been in the industry 10 years or longer, including station, office, yard, and shop employees, as well as train crews. Rather detailed occupational histories are available and, with the accumulation of mortality data over several years, such specific points as the effects of dieselization, prolonged exposure to smoke in railroad tunnels, and metal dust exposures in shops may be looked into. The important feature is that work histories and exposures be specified in some detail. Significant effects may be diluted and overlooked by considering only gross company or industry experience.

The widespread use of petroleum products makes it very desirable to gather data on workers in that industry. Some medical departments of the major oil companies have staffs well equipped to undertake such studies. The major problem here, as elsewhere, is to secure access to company records and to rearrange data organized to meet other administrative needs. In areas where petroleum operations are concentrated, data might be collected on a geographic rather than an industrywide basis. At least one study is under way in Oklahoma which may yield some information on lung cancer risks among oil industry employees.

Those advancing atmospheric carcinogen theories have pointed to the sizable urban-rural differentials in lung cancer risk *(14)*, although some further assumptions are required to reconcile this hypothesis with the great excess risk observed among males. The presence of carcinogenic substances in urban atmospheres has been repeatedly demonstrated by experiments with mice *(15, 16)*. Further epidemiological work has been hampered by the inability to classify individuals in the general population quantitatively with respect to atmospheric exposures. Meaningful histories are hard to collect, and in mobile populations, problems of classification by residence histories become complex. When leads on specific types of atmospheric pollutants are obtained from studies of special situations, the way may then be opened for return to the problem of reclassifying the general population with respect to special exposures with greater chance for success.

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SMOKING OF TOBACCO

Although at least 14 retrospective clinical studies *(17)* have reported on the association of smoking and lung cancer, these studies have been criticized on a variety of technical grounds. The objections advanced cover such points as interviewer bias (interviewers in some studies knew the identity of lung cancer patients and controls at the time of interview), and bias arising from selection factors associated with hospital admission (in most studies only hospitalized lung cancer patients were interviewed). However, the objection based on knowledge of the identity of patients and controls ignores the evidence of Doll and Hill *(18)* that males erroneously interviewed as lung cancer cases, as established by later events, showed smoking histories characteristic of the control rather than of the lung cancer series. Because of possible selection factors involved in taking up the smoking habit, some feel that the tobacco-lung cancer associations reflect associations with other common, but still unidentified factors.

The present data on associations between smoking and lung cancer are the most extensive and afford the most opportunities for discussing additional studies. For orientation, the type of evidence now on hand may be compared with the epidemiological findings for cholera, pellagra, and dental caries, all diseases in which animal experimentation played a minor role, at least in the early phases of the investigation *(19-25)*.

On review, the basic core of associations on smoking and lung cancer must appear as impressive as any produced in these other investigations. However, lung cancer does not present the features of geographic localization characteristic for cholera, pellagra, and the absence of dental caries, which made it possible to elaborate in a rather straightforward manner the basic associations with water supplies suspected of contamination (cholera), diet (pellagra), and fluoridated water (dental caries) with corroborative detail and combinations of isolated special situations. Such detail is helpful in ruling out some association as not significant etiologically; in this manner, for example, the associations between cholera and altitude (within London) and be-

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tween pellagra and mill village occupations could be discarded as not significant. For lung cancer, there are as yet no counterparts, for example, to the cholera patient in an isolated rural area who regularly sent for water from the famous Broad Street pump *(19)*; to the absence of pellagra among doctors, nurses, and attendants in mental institutions, although the disease was common among patients; to the peculiar age distribution for pellagra in a children's institution where the disease was limited to children between the ages of 6 and 12; to differential attack rates for dental caries by gradations of exposure to fluoridated supplies among natives and in-migrants; and to the sequence of dental events following shifts in the source of a community water supply. Collection of such details generally results from the study of populations. This is one of the reasons why forward studies on lung cancer among defined population cohorts are so important.

Furthermore, the epidemiological models for cholera, pellagra, and dental caries have been put to the test in the successful application of control measures. For pellagra, only the addition of meat and milk to the diet was involved *(26)*. Fluoridation effects could be observed under controlled conditions because of the happy accident of public water supplies; if private wells were the only source of water, the problem would have been complicated by self-selection of families fluoridating their own supplies. The test of Snow's conclusions on cholera *(19)*, which required implementation through administrative decisions on methods for control of public water supplies, occurred much later, more than 10 years after he had formulated them.

The right combinations of circumstances to permit such straightforward tests of most of the proposed lung cancer etiologies are not present now. Thus, the immediate lines for further work on the nature and meaning of the smoking-lung cancer associations are to develop reasonable facsimiles to tests by control measures and to assemble supporting, corroborative details from population studies, not overlooking any negative evidence which may appear.

SUBSTITUTES FOR DIRECT TESTS

As a substitute for a direct test by control measures of the smoking-lung cancer model one may look for groups in which smoking is either proscribed for religious reasons or does not otherwise form part of the cultural pattern.

Two of the four basic study elements required are at hand: data on the distribution of smoking habits in the United States population (collected as part of the Current Population Survey for February 1955), and data on lung cancer mortality (from publications of vital statistics offices). The major problems would be to secure the cooperation of the groups selected and to develop procedures to obtain the counterparts of these data for their memberships. To avoid artifacts which might be introduced by classification procedures, the primary test must be whether the overall lung cancer mortality in the group studied was markedly less than for an appropriate segment of the population of the United States and commensurate with differences in the smoking patterns. To this, other refinements may be added, such as observing whether mortality differences between the study and control populations disappear when specific comparisons are made by amount of tobacco smoked.

The limited number of countries which can provide reliable diagnostic data on causes of illness and death has discouraged similar studies of groups abroad which have unusual smoking patterns. However, special study situations may be encountered. One illustration is cited, without judgment as to its intrinsic merit. The director of the Hadassah medical organization recently reported the absence of a single case of lung cancer among Yemenite Jews in Israel during the past 15 years, and he further observed that they did not smoke cigarettes but used a form of Oriental water pipe *(27)*. Israel is a country with western standards of medical care and this lead may be worth pursuing. In these matters, the importance of reviewing the primary sources of population, morbidity, and mortality data should be stressed.

Other clues may lead indirectly to population groups with unusual smoking histories. For example, Steiner *(6)*, on the basis of necropsy evidence in Los

Angeles, has found a possible exception among Mexicans to the usual sex ratio for lung cancer; the proportion of Mexican women with lung cancer at autopsy approaches the proportions for Mexican men. This suggests the need for further studies among Mexicans to confirm the facts and to uncover possible reasons for the aberrant sex ratio for lung cancer. This might conceivably lead to the finding of a group of unusually heavy smokers among women, a useful contrast to the experience of abstainers.

CORROBORATIVE DETAILS

Additional details on the nature of the smoking-lung cancer relationship should be assembled from large-scale forward studies. These possibilities were obviously in the minds of those who planned the American Cancer Society and the National Cancer Institute-Veterans Administration studies. Both study groups consist mainly of men between the ages of 50 and 69, the ages of highest lung cancer incidence.

One approach is to expand the evidence on the nature of the association by detailed cross-classification. Epidemiologists have long accepted the principle that the etiological significance of an association is enhanced if it can be shown to persist within a variety of sub-universes. The National Cancer Institute-Veterans Administration cohort can be subdivided with respect to occupation and industry. By lengthening the observation period to several years, further tests can be applied in both studies, including checks on the consistency of regression relationships between lung cancer mortality and amounts of tobacco smoked for several occupational groups and for urban and rural residents.

Additional tests can be pursued by relating age at death to "age started smoking" to see if any consistent pattern emerges.

STUDIES AMONG WOMEN

Unfortunately for study purposes, the spread of "age started smoking" is not too great among men, and it may be hard to assemble sizable cohorts for the more unusual combinations of year of birth and "age started smoking." Women would be more promising subjects, since women of all ages began smoking in large numbers during the 1930 decade, and duration of smoking by women is not so closely tied to chronological age. For this reason, more prospective and retrospective studies on smoking and lung cancer among women would be rewarding. In addition to the one series of studies on smoking among women reported by Doll and Hill *(28)*, two retrospective studies are known to be under way. The relative rarity of lung cancer among women imposes severe study handicaps and has undoubtedly deterred other efforts.

Potential cohorts for followup would include employed women covered by group life insurance policies. To minimize turnover and loss to observation it would be desirable to restrict the cohort to employees with several years' service.

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1. Rehfuss, M. E.: Indigestion, Philadelphia, W. B. Saunders Co., 1943, p. 322.
2. Shaftel, H. E.: J. Am. Geriatrics Soc. *1*:549 (Aug.) 1953.

Studies of lung cancer among women should establish what part, if any, of the sex differential in lung cancer mortality (or incidence) disappears when comparisons are made specific for smoking class. The fragmentary Doll-Hill data suggest that a good part, but not all, of the sex differential may be accounted for in this manner.

INDIRECT CHECKS

Retrospective and prospective studies may be viewed as efforts to secure etiologically meaningful data, which official vital statistics sources cannot provide, since they are limited to classification by standard demographic variables. There is another transitional bridge by which vital statistics data on lung cancer deaths can be utilized. By taking information on smoking patterns in the general population (collected in Current Population Survey for February 1955) and applying to them the data on absolute and relative lung cancer risks by smoking class as reported in the preliminary results of the American Cancer Society study *(29)* and in several retrospective studies *(30)*, the "expected" distribution of lung cancer deaths can be computed by sex, urban or rural residence, geographic region, and broad occupational groups, on the assumption that risks by smoking class in the groups studied hold also in the total population. Comparison of the observed and "expected" numbers of deaths would then show how much of the prevailing variation in lung cancer mortality can be

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accounted for by considering smoking histories. In this manner, some useful consistency checks on the smoking-lung cancer model would be provided.

Such consistency checks need not be confined to smoking histories. The Current Population Survey material illustrates an economically feasible means for remedying some deficiencies in standard population classifications. Although many investigators have expressed the need for procuring information on the population distribution of characteristics under study, they have often been deterred by the cost. Probability sampling methods for gathering such data can provide a powerful tool to the epidemiologist.

OTHER POSSIBLE FACTORS

Turning from suspected environmental agents with properties which permit direct contact with lung tissue, several possible causes of lung cancer remain. There is the class of environmental agents which do not come in direct contact with lung tissue. Closely related would be possible tissue changes induced by virus and other infectious agents. Constitutional susceptibility might also be considered. If some persons have a predisposition to attacks on lung tissue by some morbid process, the rise in lung cancer might be due to the suppression of "competitive" respiratory causes, such as tuberculosis and pneumonia. Finally, there is the possibility of the association of smoking with other physical, psychological, and emotional factors which may be engendered by the processes influencing persons to take up smoking.

In dealing with lung cancer, where prospects for tests of etiological relationships by trial of control measures are remote, other hypotheses, however unlikely, and the collection of evidence to support or discredit them should be encouraged. The pursuit of other lines of investigation will be useful. If results are positive, another effect of lung cancer will have been discovered; if negative, they will buttress the interpretations applied to effects already known.

Gilliam, in a general discussion of chronic disease epidemiology, alluded briefly to a variety of items investigated by him in a study of lung cancer patients and controls, using the retrospective, case-history method *(31)*. These items ranged from color of eyes and use of dentures to histories of illnesses and use of general anesthetics. As he hastens to say, such individual findings cannot be used for any generalizations. However, it may be worth while to inquire systematically into other findings collected but never deemed worthy of report. Several of the other early retrospective studies were "shotgun" inquiries and collected information on a variety of suspected agents and exposures. Collectively, these results might prove useful for testing and discriminating between hypotheses and the planning of further studies.

Several studies exploring characteristics differentiating smokers and nonsmokers may be expected. The question of differences between the two groups arises because smokers select themselves; smoking is not a treatment which can be studied experimentally by randomized application to a population. There is a wide range of possibilities for retrospective studies on the physical, psychological, and emotional attributes of smokers and nonsmokers. The demonstration of an item as being associated with smoking history is essentially a screening device. The further test is whether the item, when applied to a population, produces differences in lung cancer risks equal in magnitude to those yielded by smoking history classifications (if smoking history is uncontrolled), or whether an effect is observed when smoking history is controlled by classification.

ASSOCIATION WITH OTHER ILLNESSES

Some theories on the subsequent increased risk of lung cancer among persons with histories of respiratory illnesses such as influenza, pneumonia, bronchitis, and tuberculosis, based usually on clinical and pathological impressions, have been reviewed by Doll *(32)*, who continues on to point out some observations inconsistent with these theories. No associations of lung cancer with the presence or absence of an antecedent illness have yet been established by observations on populations through the use of retrospective or prospective studies. Retrospective studies are handicapped in this field, because patients with lung cancer and other res-

piratory disorders apparently recall previous respiratory ailments more readily than do other persons. There are some possibilities for forward studies on cohorts known to have recovered from specific illnesses, free from the "recall" bias in the retrospective approach, which may be exploited. For example, records can be assembled of World War I veterans who had influenza and/or pneumonia in 1918. These veterans can be traced forward in time to determine their lung cancer mortality experience. (A study of British veterans *(40)* has been published recently.) From civilian life, one could draw on recovered pneumonia cases reported to health departments in the 1930 decade, when these agencies had active programs based on pneumococcus typing and distribution of serum.

If excess lung cancer mortality among such groups were demonstrated, this would not necessarily be a result of effects of antecedent illnesses. If constitutional predisposition of lung tissue were a factor, the rise in lung cancer mortality might be due to the suppression of tuberculosis and pneumonia as causes of death. If a genetic basis for constitutional predisposition to lung cancer were postulated, other tests could be devised. One approach would be to assemble lists of relatives of diagnosed cases of lung cancer for followup to determine lung cancer mortality. Lists of familial contacts could be assembled from records maintained in tuberculosis control programs. Investigations of this character might be undertaken more readily in some European countries, where population mobility is low and more comprehensive population record systems exist.

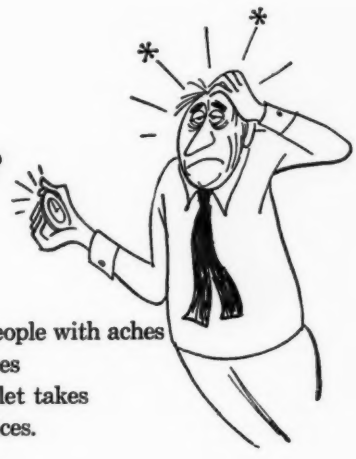
RETROSPECTIVE AND FORWARD STUDIES

The preceding sections have emphasized the wide range of possibilities for the use of retrospective and forward study techniques. Retrospective, case-history studies use as their point of departure diagnosed cases of a disease and matched controls and compare antecedent events in their previous histories. Prospective, or forward, studies start with the assembly at a fixed point in time of defined cohorts classified with respect to certain attributes, trace them forward in time, and note events occurring subsequently.

Perhaps the major criticism of retrospective studies for lung cancer has been that diagnosed cases have generally been drawn from hospital populations. Positive association between two diseases, not present in the general population, may be produced when hospital admissions alone are studied, because persons with a combination of complaints are more likely to require hospital treatment *(33, 34)*. Smoking is not an illness, and for lung cancer it is difficult to see how the smoking history could have any influence on hospital admission. Lung cancer is a serious disease normally requiring hospitalization, and roughly four-fifths of all diagnosed cases are hospitalized *(35)*. The proportion is even higher when microscopically confirmed cases alone are considered. There would have to be extraordinary differences in smoking histories between hospitalized and nonhospitalized patients and controls to upset inferences drawn from hospitalized cases *(36)*. So far, the results of forward population studies on excess lung cancer risks among smokers as compared to nonsmokers have agreed in general with those of the retrospective studies. This suggests that biases entering into the selection of hospitalized cases and controls studied retrospectively are probably not the source of the associations noted.

The fundamental assumption underlying retrospective studies and the estimation therefrom of differences in risks between population groups is that the diagnosed cases and controls each be representative of the universe chosen for investigation. Although there are precautions which can be taken in devising a sampling plan, this representative property cannot be guaranteed merely from internal examination of a single set of data. One must be guided on this point by the comparison of results from several studies and judgment as to the possible biases operating in any setting.

Forward population studies have been questioned on the grounds that the cohorts have not been selected by probability sampling methods and that individual study results cannot be generalized to the total population. The expense involved in tracing cohorts drawn from the general



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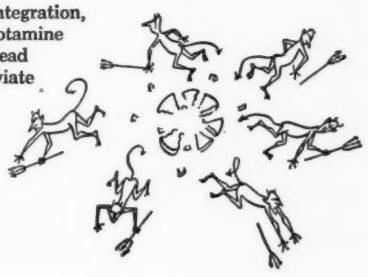

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population by probability sampling methods would be great and most investigators have been forced to look for populations followed routinely for other purposes, such as persons covered by employment or insurance benefits.

The criticisms of unrepresentative sampling would appear to disregard the experience available from actuarial sources. There are two common types of insurance: "ordinary" policies, which require applicants to pass a physical examination, and "industrial" policies, which undergo some underwriting selection but require no physical examination. Policyholders would scarcely meet the usual criteria for representative samples. The Metropolitan Life Insurance Co. has published extensive data on the mortality experience of their industrial policyholders and finds rather close agreement with the mortality experience of the general population, after appropriate adjustments for age, sex, and race composition *(37)*. Data drawn from actuarial experience and reported in such sources as Length of Life *(38)* and *The Statistical Bulletin*, a monthly publication of the Metropolitan Life Insurance Co., indicate that the relative patterns of mortality with respect to cause, age, sex, race, and geographical region in insured populations have their counterparts in general mortality experience despite some differences in magnitude of rates. The cohorts assembled for smoking and lung cancer investigations do not appear to have been subjected to more rigorous selection than that encountered by industrial policyholders, nor is there reason to believe that the selection effects which did exist discriminated between smokers and nonsmokers. Even when stronger selection effects on mortality experience exist, as in the case of ordinary policyholders, it is well known that the selection effects of physical examinations on mortality experience wear off quickly; very conservatively, in 10 years or less *(39)*, usually in about 5 years. If there is any question about the prospective study results on the association of smoking and lung cancer being affected by selection, the conservative course would be to discount the first few years' experience and to require that the early results be confirmed by later experience after selection effects have worn off.

The collation of experience from several studies is also a safeguard against error in generalizing from forward studies on lung cancer. Data from prospective studies may be subclassified by other population characteristics and further checked for internal consistency. With these precautions, the dangers of drawing inferences from forward and retrospective studies inapplicable to the general population seem rather remote.

SUMMARY

The size of the lung cancer problem, as indicated by the number of lives at stake and the economic implications of any potential control measures which might later be advanced, should not blind investigators to the many possibilities for studies similar to those on other chronic diseases which have yielded some of their secrets to the epidemiological approach. Diseases showing pronounced variations in risk among population subgroups are the more amenable to epidemiological study; and lung cancer falls into this category. Studies on human populations should continue to play an important role in delineating possible etiological relationships for lung cancer, the mechanisms for which could then be elaborated by animal experimentation.

Progress must come by the cross-checking of the several results of epidemiological studies, animal experimentation, and other laboratory findings. The issues will probably be settled by an evolutionary process, as was the fluoride-dental caries relationship. Gradually, the meaning of certain associations will become accepted. Dissent will die off and the debate will shift to the many other points in any epidemiological models still requiring elaboration.

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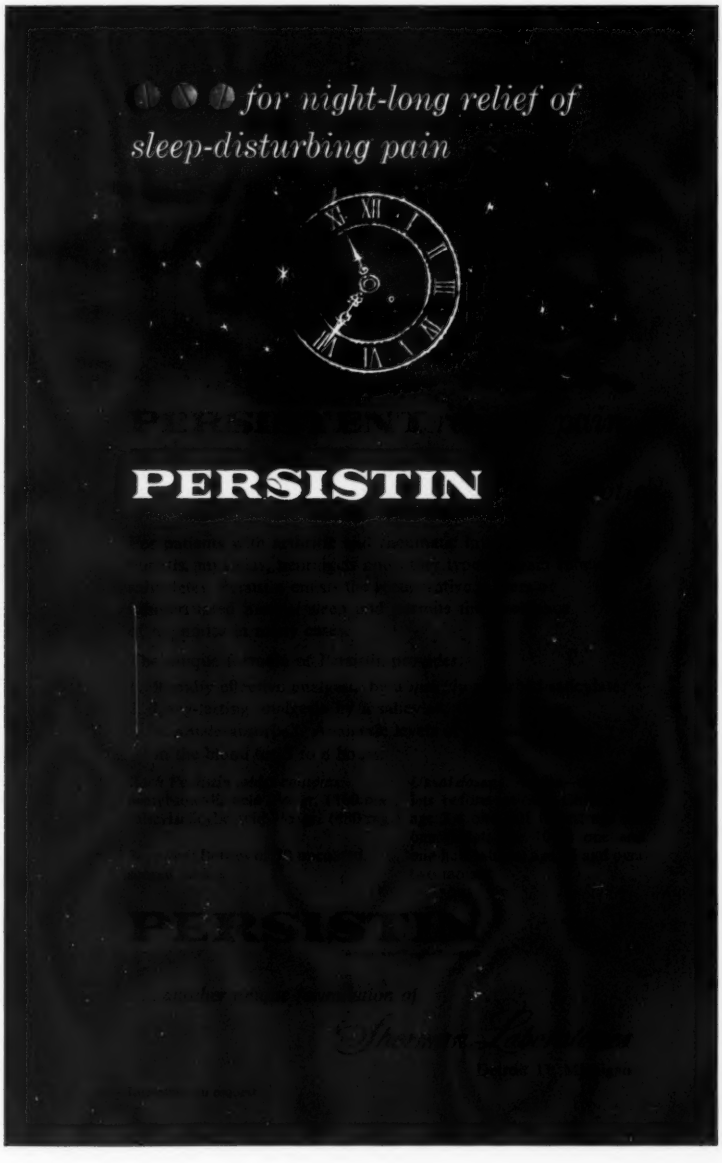

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UNFINISHED BUSINESS IN MATERNAL AND CHILD NUTRITION*

By Marjorie M. Heseltine, M.A.†

Progress in recent years makes it possible to talk now about unfinished business in maternal and child nutrition. Even though we lack precise measures of nutritional status, few people doubt that mothers and children, on the average, are in better nutritional condition today than they were 20 years ago. But the very size of our accomplishments makes it necessary to emphasize that there is unfinished business. Some people seem to think we can afford to forget about nutrition programs for mothers and children and turn our attention entirely to overfed adults and the chronically ill of all ages. I dissent. Let me tell you why.

First, there is the magnitude of the problem. As Dr. Martha Eliot, chief of the Children's Bureau, pointed out to the Association of State and Territorial Health Officers in 1952, this Nation is growing younger faster than it is growing older.[1] Realizing that this statement was contrary to the prevailing impression, she went on to say that during the preceding decade, the population over 65 years of age had increased 37 percent but the population under 5 had grown by 55 percent.

Because of improved maternal care, the 4 million babies that are born annually may be spared many of the hazards of delivery and early infancy. But their birth certificates carry no guarantee that they will receive the daily dietary allowances recommended by the National Research Council. If an infant is to get the food he needs for optimal growth (please note that I do not say maximal growth, a point I shall discuss later) under conditions that make for good physical and emotional development, parent education in nutrition must go on and on as long as women have babies. Then, too, there is sufficient indication that what happens during childhood has a bearing on health during adult life to warrant continuing attention to maternal and child nutrition if only for its long-range influence on health problems of later maturity, which are now so much in the limelight. Public health nutrition services should be directed toward the older age groups, but programs should continue to serve maternal and child health as well.

My colleagues in State child health and crippled children's programs offer another reason for urging no diminution in maternal and child nutrition work: Generalized undernutrition, they say, can still be found among children in the United States, and even cases of dietary deficiency disease are seen occasionally from cultural groups that have not shared in the widespread economic prosperity. It is true that we have to look much more sharply for instances of malnutrition than we once did, but those we see are all the more distressing in these prosperous times. The comments of a young nutrition trainee from a so-called underdeveloped country after she had taken part in a dietary survey among low-income rural families in the United States are pertinent here. In a personal letter to an understanding American friend, she wrote: "Speaking of diet, I believe that the poor people of these counties . . . have a diet more deficient than the poor of my country. In a large family of 8 members, one housewife here reported that they spent only $5 a week for food. This whole family is ill, and no wonder. And like this family, there are others and others. I also have the impression that these people show a greater sadness because they see from so close the comforts that they would like to attain."

The task ahead in maternal and child nutrition falls into two main categories, as I see it. We need to know more, much more. We need to do more with what we already know, and even with hypotheses that we think may be confirmed by research.

REQUIREMENTS FOR OPTIMAL HEALTH

Of the many aspects of maternal and child nutrition that we need to know more about and to do more about, one is

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†Miss Heseltine is chief of the Nutrition Section, Division of Health Services, Children's Bureau, Social Security Administration. Since this paper is based on her address at the 1955 meeting of the Western Branch of the American Public Health Association, the illustrations are drawn largely from the western part of the country.

the matter of nutritional requirements for optimal health at all stages of development. In 1953 the Food and Nutrition Board of the National Research Council issued the third revision since 1943 of its Recommended Dietary Allowances.[2] The ink was hardly dry on this revision before the recommendations for protein allowances during the first year of life were challenged as being unnecessarily liberal. A committee of the board is now reconsidering these recommendations, and the Academy of Pediatrics has appointed a committee on nutrition which will direct attention to the matter. These recommendations, which represent "nutrient levels selected to cover individual variations in a substantial majority of the population" and which must never be confused with minimal requirements for an individual, are sure to be revised again and again as research throws more light on nutritional needs.

We need to know much more about satisfactory rates of growth in children. As two research workers said, we need to find the "answer to the important medical-nutritional question regarding the degree of conformity to a norm to be expected on the part of an otherwise healthy child."[3] Longitudinal studies, such as those now under way at the Colorado Child Research Council, have already given us a respect for individual differences.[4]

Although it is not easy for Americans to give up our "bigger and better" concept, there are those who are impressed by the questions raised by Prof. R. A. McCance of London. He asks whether the attainment of large size through very rapid rates of growth is in the interests of optimal health either during childhood or in later life. The following statements from one of his lectures may whet your appetite to seek out his provocative papers on overnutrition and undernutrition:[5] "Animal husbandmen have bred and fed their animals for rapid maturity and marketable qualities and political husbandmen have come near to doing the same for children. Curiously little work or thought has been devoted to a study of the desirable plane of nutrition for the different years of human endeavor."

INTRODUCTION OF SOLID FOODS

If infants are not expected to grow at ever more rapid rates, there may be some revision in our ideas about the time for introduction of solid foods into the diet. The Child Health Center at the University of Washington has pioneered in trying to discover whether there is any difference in the progress of babies given solids by the end of the fourth week and those not given solid foods until the age of 9 to 12 weeks. Two researchers at the center could not detect any significant difference in the development of the two groups of infants in their response to solid foods.[6]

Another approach to this question was taken by a group of pediatricians. By means of questionnaires, they obtained information from more than 2,000 of their colleagues in all parts of the country.[7] There was general recognition of the trend toward early introduction of solid foods, but as one pediatrician put it: "The major factors underlying the current trend to earlier feeding of solid foods are more probably social than they are nutritional or medical." And in case anyone thinks that parents take their pediatrician's recommendations without demurring, you should know that 59 percent of the pediatricians reported that they "experienced considerable pressure on the part of the mothers for the early introduction of solid foods." The consensus was that there is no physiological basis for introducing solid foods before the age of 3 months.

FOR HEALTHY TEETH

Still another aspect of maternal and child nutrition about which we need to know much more is the relation of nutrition to healthy teeth and to their resistance to caries. It seems to be well established that the development of structurally sound teeth is dependent on a supply of nutrients that have their source in the ingested food. The argument begins on the question of the effect of diet on the susceptibility to caries of the fully formed tooth. Many discussions have been devoted to that topic, but the net result, it seems to me, is that the proponents of the various schools of thought have become more convinced than ever

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of the validity of their evidence whereas neutrals have become only more confused.

Fortunately, research on this question continues, and the prospects of an answer become brighter through the use of such new tools as electron microscopy and radioactive tracer techniques. There is certainly some indication from recent studies that enamel is permeable both from the oral cavity and the bloodstream.

DIET AND PREGNANCY

We need to know more about the relationship of diet preceding and during pregnancy to the well-being of the mother and infant. Teams of research workers in various medical centers have approached the study of nutrition during pregnancy quite differently and, as might be expected, have often failed to confirm each other's findings. Does that mean that we should no longer claim that what a woman eats during the maternity cycle is important? A question as direct as that was put by a nutrition workshop participant last summer to a young obstetrician who had just reported that a large-scale study had failed to reveal major differences between the nutritional condition of women who had had good diets and those who had had poor diets during pregnancy. As this physician was known to be an expectant father, he was asked: "What are you advising your wife to eat?" Thereupon, the nutritionists listened to the kind of dietary recommendations that they wish every pregnant woman might receive from her physician. His study may not have shown that diets somewhat below prevailing standards of adequacy had had a deleterious effect; but he was well aware of other studies that had shown diet to be important, and he wanted his wife to have the benefit of the doubt.

There would seem to be some rather impressive evidence in regard to the consequences of drastic limitation of calorie intake during pregnancy. Studies in Chicago have shown that when the energy requirements of the pregnant woman are not met, storage of nitrogen in the form of protein does not proceed at a satisfactory rate.[8] Other studies indicate that women who are underweight at the beginning of pregnancy and who fail to come within a normal range during the first two trimesters have a higher than average proportion of premature infants.[9] Nevertheless, I have been told of a teaching hospital that has only recently abandoned the routine prescription of a 1,000-calorie diet for prenatal clinic patients. The woman who is given such slim rations is sometimes told that it is important to control the size of the fetus. Yet there is impressive evidence that a diet so restricted as to affect the weight of the infant is pretty sure to take its toll on the mother. Periods of famine do result in lower birth weights. They also are likely to impair the health of childbearing women.

NUTRITION EDUCATION

Thus far, I have dealt only with the need for extending our knowledge of nutritional requirements and with the importance of putting into practice the concepts that have been evolved by our most authoritative leaders. But in order to put into effect what we know about nutrition, we need to know more—much more—about the people to whom nutritional programs are directed.

Nutrition education has come a long way since the days when the nutritionist was a feminine lone ranger, who prepared her own educational material (usually mimeographed, single spaced), jumped into her car, traveled across the State to a county where there might or might not be a public health nurse, rounded up a group to listen to her talk or watch a demonstration, got back into her car, and returned to the State office. In those days, the public health nurse was not expected to know anything about nutrition. If she strayed beyond underlining the appropriate paragraphs about diet in the pamphlet she handed to a parent, she did so at her own risk. Community organization, group dynamics, the consultant-consultee relationship—all these were concepts that she had never heard of. There was no thought given to modifying teaching about foods to fit cultural patterns, for the emphasis was on Americanization. If cream soups were accepted by middle income Anglo-Americans, it was assumed the sooner recently immigrated Mexican mothers learned to

make cream soup the sooner they would evolve into 100-percent Americans.

Currently, nutrition enters into the daily activities of many kinds of public health workers. A large proportion of them are equipped by training and experience to deal effectively with the run-of-the-mill nutrition problems, although, of course, they recognize the need for technical assistance from a nutritionist—hopefully one who is accessible enough to give help when it is most desired. Increasingly, nutrition consultation is focused not on what is new in nutrition but on how to make what is old (and as far as we know still true) function in the lives of people. Maternal and child nutrition teaching has been profoundly influenced by the writings of such men as Aldrich, Senn, Richmond, and Spock. Good nutrition is viewed not as an end in itself but as one factor in the development of a sound body and a healthy personality.

Knowing what is considered an appropriate diet for a parturient woman and her infant and why certain values are attributed to certain foods is only the starting point for soundly motivated education in maternal nutrition. Beyond this, we must understand the ways of life of the people whom we are trying to teach. In work with cultural groups that have different value systems from their own, public health workers have found a new ally in the anthropologist. A paper on midwife training by Dr. Isabel Kelly,[9] an anthropologist with the United States Operations Mission to Mexico, provides the following illustration of how a health worker and a social scientist may cooperate in solving a problem:

In certain Mexican villages, the women were unwilling to drink water during the later months of pregnancy or to give either water or fruit juice to their babies. As a result, both mother and child were deprived of essential fluids, and the child did not get the necessary amounts of vitamin C. Dr. Kelly and a nurse midwife worked out this solution: an increase in consumption of the herb teas that are an accepted part of the diet of these people and addition of an ascorbic acid tablet to the tea before it is given to the babies. The women were quite willing to make these modifications in their habits.

Dr. Kelly does not suggest that the practices found in these villages will persist indefinitely; she merely points out how a practice may serve effectively for the present. As Dr. Cicely Williams, who has done maternal and child health work in many parts of the British Commonwealth, states in an article on nutrition,[11] "Many of the customs recorded by social anthropologists are not (as commonly supposed) unalterable but can be replaced by more rational and advantageous behavior once the position has been explained and understood. Often one sees the term 'social and cultural customs' used to dignify habits which are merely the result of ignorance and carelessness."

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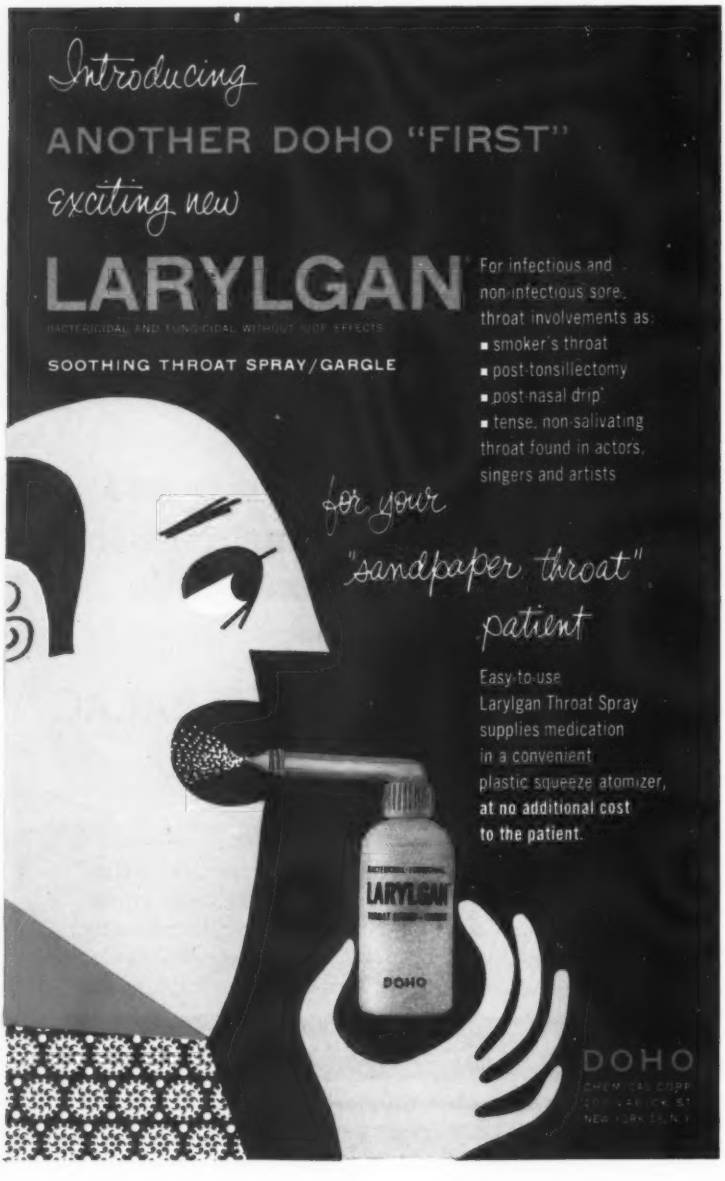
Not only can health departments do more about applying what is known in nutrition, they can also contribute to the knowledge that is to be translated into programs. I am not suggesting that health departments should embark single-handedly on ambitious nutrition research projects; but I am suggesting that they can cooperate with other agencies in mutually beneficial programs and that they can undertake modest factfinding activities on their own.

As an example of the former, I am thinking of a statewide study of food habits of families with children that was conducted by the New Mexico Department of Public Health and nutritionists in the New Mexico Agricultural Experiment Station.[12] As a result of this study, the health department has a much sounder basis for its nutrition programs in behalf of children.

I could cite many examples of the latter, but I will mention only two. A district nutritionist in Florida, with help from the State health department, worked out a device for learning what some of the words that come trippingly on the tongues of prenatal clinic staff mean to the patients. She learned, among other things,[13] that to some of the patients "nutrition" is "the man who lays out dead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folks." We can well believe that clinicians and nurses in that part of Florida will no longer tell a prenatal patient to "talk to Miss C . . . about your nutrition." In a county health department in California, a Spanish-speaking nurse, with the encouragement of her supervisor and help from a State nutrition consultant, undertook to find out what the Mexican-American families in her district were eating. The data she obtained would not permit an easy generalization. There was as much disparity between low-income and prosperous families as would be found in an Anglo-American group.

In conclusion, let me emphasize that the unfinished business in maternal and child nutrition is to a large extent the business of all public health workers. Seek help from the nutritionists and complain long and loud when you can't get it. But don't expect the nutritionist to do the job alone.

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PUBLIC HEALTH IN A CHANGING WORLD*

Herman E. Hilleboe, M.D., F.A.P.H.A.†

Among the many public health problems to which I might address myself on this important occasion there are four that try to the utmost the knowledge, skill, insight, and imagination of the public health and allied professions. I refer, in particular, to the manifold challenges of the chronic diseases, to the profound difficulties that characterize mental and emotional disorders, the pressing demands for medical rehabilitation, and the urgent need for evaluation of programs directed toward meeting these and other public health needs. All of these problems cannot be explored fully at this time, but I will try to present the salient points that merit our attention. Our future success depends upon our collective ability to adapt to current demands and also upon the realism of our analyses and evaluation of the whole structure of public health activities.

CHRONIC DISEASES

Solving the historic problems of public health has created many new and complex problems. In preserving life from the ravages of the acute communicable diseases, public health and medicine have helped man to live longer. But in living

*Presidential address to the American Public Health Association at the first General Session of the Eighty-Third Annual Meeting in Kansas City, Mo., November 15, 1955. Reprinted by permission from *American Journal of Public Health and the Nation's Health*, December, 1955.

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longer man now is beset with the chronic diseases and the disabilities of middle and old age.

The twentieth century brought immunization against such diseases as smallpox, diphtheria, tetanus, and later against plague, cholera, yellow fever, and typhus. Immunization of persons against these dread diseases is today a common and accepted procedure. The latest advance in this field is, of course, the Salk vaccine against paralytic poliomyelitis. Experience with this new immunizing agent has demonstrated its effectiveness in preventing the paralytic form of the disease. For example, preliminary experience in New York State among two-thirds of a million children, 6-10 years of age, showed that five times more paralytic poliomyelitis occurred among unvaccinated children than among the vaccinated during the polio season of June through October, 1955. We still have much to learn about dosage, type, number and interval of injections, and duration of effectiveness. However, from our extensive experience in New York State we have full confidence in the safety and potency of the Salk vaccine as it is manufactured and tested today.

Of significance to our discussion on public health in a changing world is the fact that in the United States in 1900 an estimated 133,000 persons died from communicable diseases, while in 1953, the latest report available, there were only 9,000 such deaths. These diseases no longer constitute our main causes of death; one result is that more children live to become adults.

With the threat of communicable disease among children minimized the pendulum swings to the chronic diseases and disabilities especially among older persons. The increase in life expectancy offers benefits to the individual but at the same time it adds social and economic burdens to the community and the state. We must prepare now to meet the special public health problems of this group of people.

A health program for older people cannot start at age 60, or 65, or 70; it must begin during early adult life at the time that chronic diseases begin to attack the mature body. A sound program directed against the chronic diseases of adult life is truly preventive geriatrics. As the work capacity begins to dwindle in middle age and later years, health resources must be measured and remaining vitality conserved.

The major causes of death in the United States today are the chronic diseases, especially diseases of the heart, cancer, and cerebral vascular lesions. For example, in an effort to counteract the ill-effects of heart disease state health departments are broadening and strengthening their control programs. In our state we have cooperated with the Albany Medical College in establishing a heart program in which male state employees between the ages of 40 and 55—those most susceptible to coronary disease—are regularly examined at a Cardiovascular Health Center. Some 2,000 employees have been examined annually since 1953 with a number of valuable results.

What is the purpose of such a project? First of all, it gives a preventive service to state employees; but equally important, it is a research effort to learn how best to detect heart disease at an early stage and to develop new methods of effective and economical screening to find cardiac disease. We hope to gain basic knowledge of the preventive aspects of coronary artery disease and hypertension. We use this research project for the teaching of medical students and also for postgraduate education of general practitioners and health officers in the area. This is the type of project which should be a vital part of larger health departments, so that they may better meet the challenge of this crucial public health problem.

So it is with cancer. In the United States today more than half of the cases occur in persons past the age of 60. Unfortunately, we know little about the cause or causes of cancer. Yet there are many useful things we can do until etiology is determined. However, our approach to this problem is similar to our attack on heart disease—early detection, adequate medical care, rehabilitation, and research into all three phases of control. The New York State Health Department has taken an important step in combating this disease with the addition of facilities to the Roswell Park Memorial

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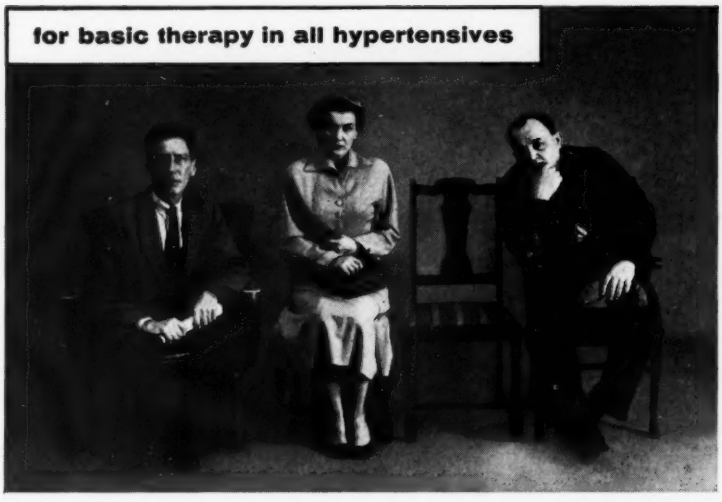

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Institute, the state's cancer research center at Buffalo. The increased facilities include a new 500-bed research hospital with its associated laboratories and animal farms. Here, outstanding scientists from many nations are given the opportunity to seek new knowledge of the causes and treatment of cancer.

Our state has recognized its official responsibility in combating this disease by appropriating over five million dollars annually for the operation of this research institute. If the wealthier states accept such responsibility for the protection of the public's health, our goal should be reached that much sooner. Again, as we apply new knowledge of cancer we lengthen the life of affected individuals and further magnify the magnitude of the problems of chronic disease and especially rehabilitation.

The vascular lesions affecting the central nervous system, which so often result in lingering disability, constitute the third major killer in the United States. As a challenge to physical medicine and psychiatry these lesions rank high among the chronic diseases. This affliction leaves many persons partially paralyzed, some of them permanently. It also creates an additional problem for mental hospitals. Many of the patients in such hospitals are there because of the mental and physical complications of cerebral vascular lesions.

When we go on to consider other chronic ailments—arthritis, neuromuscular disorders, and diabetes—we find that rehabilitation plays a predominant role in the prevention of their progression. Because of the high prevalence of these conditions and their tendencies to be prolonged, the basic elements of early detection and adequate medical care must be complemented by medical rehabilitation programs so that sufferers may learn to live with their handicaps. Research must be carried forward to give us better tools with which to work in all three of these activities.

In the acute communicable infections we strive to prevent occurrence of disease. In the chronic diseases, however, pathology is usually already present, so our job is mainly prevention of progression; in so doing we alleviate suffering and avoid premature death. There are many excellent examples of chronic disease programs throughout the country. Just to mention a few, there is the broad program of the California State Health Department, the multiple screening activities in Virginia, and the pilot studies on atherosclerosis and nutrition in Minnesota. What we need are more of these programs in every state and territory.

MENTAL HEALTH

Mental disorders constitute the greatest single cause of disability and illness among people in America today. The problem is a growing one and requires all the resources that the community can allocate to its solution.

It has been estimated that about 25 per cent of the nation's labor force suffers from some form of emotional disturbance. This situation and its attendant dislocations, in terms of wages paid for no productive results and in terms of damage to men and machines, cost industry and labor billions of dollars annually. Every year a quarter of a million new patients enter mental institutions. Our mental health experts tell us that one out of every 12 persons will sometime during his life become a mental hospital patient and that in the United States today there are some 10,000,000 persons suffering from mental illnesses or disorders. Personnel and facilities fall far short of the demands of these unfortunate people who are swelling the ranks of the chronically ill.

It must be squarely faced that the organized public health movement has not done nearly enough to help solve the tremendous problems of mental disease in this country. Close and continuing collaboration of public health and mental health authorities in this nation is an urgent necessity. The two are complementary and never should be competitive, as too often, regrettably, they are. It is wasteful of both money and men to travel two parallel roads to the same objective; the soundest health possible, both mental and physical.

It will not be enough to go on thinking solely in terms of curative measures in the attack on mental disease. All the principles and skills of preventive medi-

cine must be brought to bear on this task.

It is a source of deep satisfaction to know that the American Public Health Association has established a mental health section within its organizational structure. In the future, as I see it, the broad field of mental health will increasingly absorb our attention and demand our action. We cannot delay giving our full contribution and still claim that we are responsive to the needs of the public's health.

MEDICAL REHABILITATION

A realistic discussion of the chronic diseases and the problems of mental health leads us inevitably to a consideration of medical rehabilitation. People stricken in their most productive and mature years must learn to live and work with their disabilities. Medical rehabilitation should start as soon as the diagnosis is made, continue on, in varying degrees, during treatment, and follow through as long as the patient can profit from such services. In some individuals this may be for the rest of their lives. Rehabilitation has taken a place of equal importance with diagnosis and treatment in the medical care of persons with chronic disease and disability.

The need for medical rehabilitation is well exemplified in tuberculosis. This disease that is virtually disappearing as a cause of death among persons under 24 is increasing as a cause of illness and disability among persons over 45. At the turn of the century tuberculosis was predominantly an acute infectious process, but in recent years with the use of new drugs and modern surgery it has become a full-fledged member of the chronic disease group. Persons with tuberculosis, even though the disease is arrested, must be on guard for the remainder of their lives to avoid recurrence. Medical rehabilitation may well spell the difference between success and failure in the continued well-being of the tuberculous individual.

Public health physicians need to have an appreciation of the important part played by family doctors in this field. Public health workers can serve best by supplementing and enhancing the work of the family physician. Medical rehabilitation, viewed in this broad perspective, is a synthesis of the skills of the family physician and the public health worker each of whom contributes to the common goal of correcting or retarding the ill-effects of disease and disability. This teamwork promotes optimum health for the community through preventive services to its individual citizens.

Medical rehabilitation of the physically and mentally handicapped calls upon every field of activity in health, vocational service, and welfare. Not only must the many different needs of the disabled individual be met adequately, but the overlapping services require meticulous synchronization. Teamwork of the highest order is necessary from the beginning to the end of the rehabilitative process. Immediately after the medical members of the team diagnose disability and make a plan of treatment the educational members bring in their vocational guidance and training. The welfare team members also are concerned from the start with the social problems of the individual and the associated problems in the home in which the disabled lives.

The same pattern of teamwork is needed among the several departments in state government concerned with medical rehabilitation. The rigidity of antiquated laws and the barriers of traditional practices too often stand in the way of realignment of duties and responsibilities to meet the present-day needs of the disabled. A new approach is essential if we are to apply the skills and new knowledge that modern science has given us.

By administrative agreement, executive order, or appropriate legislation, health departments can take the lead in all medical aspects of adult rehabilitation programs. This can be done within the requirements set forth in the federal vocational rehabilitation act of 1954 to the mutual benefit of everyone concerned.

For public health workers to direct and advise on the medical aspects of rehabilitation in no way interferes with the prerogatives of the guidance counsellors, educators, and technicians in the vocational aspects of rehabilitation. Nor does it interfere with the employment experts in the departments of labor or education in the placement programs. Interdepartmental planning can solve these problems of relationship if the depart-

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mental representatives will only learn to communicate with one another, share burdens, and divide their responsibilities.

Every state could benefit from an interdepartmental council covering the field of human resources to make full use of available personnel and facilities in medical rehabilitation. Here is a productive enterprise in which public health workers can take the initiative in those states that do not have such interdepartmental councils.

Leadership on the part of the public health profession can and must overcome the obstacles of traditional practice and rigid regulations in the provision of medical rehabilitation services, if we are to meet the increasing demands of the present day and the future. We have had a large and satisfying experience in caring for handicapped children; we can provide similar benefits to disabled adults.

For public health to accept new responsibilities and to extend existing ones in our efforts to conserve human resources, it is essential to have a high caliber of general public health services available in the community.

This leads us to the question of how to bring high quality public health services to local communities. The fundamental approach is to establish full-time health departments in communities that are now without them and that have the population and needs to warrant them.

To develop new health departments there must be public health leadership and initiative to gain the acceptance and support of responsible citizens in the community. The American Public Health Association and the National Health Council have devised plans to help you bring new departments into being. It is difficult but it can be accomplished.

It was reported early in 1955 that there were full-time health departments in all major cities of the nation and about 1,300 organized local health units serving 2,218 counties. This means that 80 per cent of the total population of the United States has full-time health departments available for service. The figure of 80 per cent shows accomplishment, but it still means that one-fifth of our nation does not have the benefit of such a health department's leadership.

The future success of local health departments throughout the nation may well depend upon the programs developed to serve citizens with chronic diseases, especially in the field of medical rehabilitation. Indeed, in planning to meet the future health needs of the nation, let us not forget that a large share of general medical care consists of medical rehabilitation.

There is considerable variation in the quality of local health departments, their financial resources and personnel, as well as the content of their programs. Some critical self-appraisal is in order to seek out the weak spots and to correct remediable deficiencies.

PROGRAM EVALUATION

This brings us to the subject of program evaluation in public health. Scien-

tific methods of evaluation are being employed successfully in industry and other large-scale activities where the skills of social scientists and management experts have application. Many of these technics and those of modern business administration are adaptable to public health work. Business management is coming of age in many of our state and local health departments.

Let us face the fact that a number of states find it difficult to obtain sufficient tax moneys to support their expanding programs. The increased demands of the people for more service and research create terrific competition among state departments for the same dollar of revenue.

In addition to the financial reasons for program evaluation, it is plain good sense to discard activities that are no longer productive or essential. Money for new programs comes easier on a transfer basis than from new sources. Tradition is not reason enough to maintain an unproductive public health enterprise of low priority.

In program evaluation it is no longer sufficient to have outside experts visit a health department, examine the records, talk to the program directors, and write a narrative report patterned after previous surveys in areas of similar size and location. This became strikingly apparent at the First National Conference on Program Evaluation held at the Michigan School of Public Health in September, 1955. The American Public Health Association was proud to be one of the sponsors of this pioneering effort.

More than one hundred leaders in public health exchanged ideas and examined evaluation technics in use in various parts of the country and in actual programs concerned with accidents, cancer, fluoridation, prematurity, and tuberculosis. In each group discussion basic assumptions were set forth. Next, hypotheses were developed. Then data were examined and analyzed to test these hypotheses. This was real evaluation in a scientific sense.

The need became apparent at this conference for clear definitions of the terms used in discussing program planning, operation, and evaluation. One person would talk about goals, another about purposes, and still another about objectives. Then we discussed functions, procedures, and activities to achieve objectives and agreed that there was disagreement in definition. These differences of opinion are capable of resolution which can be accomplished before the next proposed annual evaluation meeting.

Program evaluation requires the same meticulous skills and methodology that the epidemiologist employs in the study of an acute or chronic disease. It demands intellectual curiosity on the part of the evaluators. It is not enough to make measurements; what is necessary is measurement of results. Technics that have reliability and validity, if expertly used, can produce meaningful results.

It is clearly evident also that public health workers do not have enough pre-

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cise tools of measurement for most public health activities. So one of our tasks for the immediate future is the development of new patterns of evaluation in a variety of fields of public health. While we are developing new technics of evaluation we can use the ones we have more wisely and with greater skill.

Our colleagues in the voluntary health agencies might also profit by taking stock of their program plans and operations. Together we could determine how best to use our combined resources to meet changing public health needs. The voluntary health agencies with their flexibility in the use of funds and personnel could give tremendous impetus to the development and use of new evaluation technics.

We in the American Public Health Association have much to offer and much to gain in helping to solve problems in program evaluation and chronic disease. To this end, the American Public Health Association is sponsoring under its Committee on Administrative Practice a study in the field of chronic illness. Its purpose is to discover what is now being done by official and nonofficial health agencies to meet problems of chronic illness and disability on a community-wide basis. Evaluation technics are being examined and new ones developed for the use of public health workers who want to improve their programs. Certainly this can be a valuable project—one which can contribute significantly to the advance of public health in the United States.

SUMMARY AND CONCLUSION

It is abundantly clear that our public health problems of the future will be concentrated in older persons, among whom chronic disease and disability are increasingly prevalent. The social and economic overtones of chronic disease and disability have an impact on almost every family. Our public health programs must encompass the degenerative diseases and the long-term illnesses. We cannot delay longer or we will be hopelessly overwhelmed by the sheer weight of the burden.

This does not mean that we can relax our guard against communicable diseases, nor lessen our campaign to reduce infant and maternal mortality, nor slacken our final crusade to conquer tuberculosis. Environmental sanitation is as important as ever and requires constant vigilance to keep the air, water, and food free from pollutants, including those spawned by atomic fission. Nor can we relieve ourselves of the costly burden of medical defense against atomic, biologic, and chemical forms of potential aggression. However, it does mean that we have some shrewd planning to do, if we are to meet the demands of the future as we have met those of the past.

During this Annual Meeting experts from many disciplines in the social and medical sciences, from government and from private life, have expressed their views and predictions on the challenging question—where are we going in public health? The subject is of vital concern to all of us and was wisely chosen by the program committee to be the theme of our Annual Meeting. During the coming months the American Public Health Association will use all of its media of communication, the Journal, the Newsletter, meetings of regional groups, state societies, and expert committees to bring the challenge of public health in a changing world to health workers everywhere. I know that you will accept these challenges each in your own way and respond with every resource at your command to help solve our pressing problems.

It was my privilege a few weeks ago to participate in a conference in which national leaders from many walks of life, including medicine, discussed the interdependence of their work and their religion. In listening to these men and women and in discussing ways and means of bringing religion and work closer together, I was reminded again and again of the dedication of the vast majority of public health workers. Dedicated people are in the habit of making whatever sacrifices life demands of them. There can be no question that you have made sacrifices in the past, but your sacrifices will be even greater in the future. I am certain you can face the future unafraid because you have demonstrated that you possess the spiritual courage to meet its problems. By so doing you will share in the freedom and the blessings of a world made healthier and happier by your ef-

forts. This is indeed a time for a rededication for all of us who are in public health.

I have tried to point out a few paths into the future and to set a compass that will assist us to determine where we are going in public health. The chronic diseases, mental disorders, medical rehabilitation, and the consequent need to evaluate and reevaluate all public health programs constitute, it seems to me, urgent challenges to our profession. We cannot do less than to face these challenges with resolution and daring. The courage to do what is necessary is as basic to the character of our organization as it is to the moral fabric of the individual spirit.

I am grateful for the opportunity which you have given me to serve as your president during the past year, and I am looking forward to many more years of fruitful endeavor in the common cause.

Books Received

Books received for review during the period from March 5 to April 5, 1956, are listed below. Reviews will be published as space permits.

DOCTOR AND PATIENT AND THE LAW. Louis J. Regan, M.D., LL.B., Member State Bar of California; Professor of Legal Medicine, College of Medical Evangelists; Clinical Professor of Forensic Medicine, School of Medicine, University of Southern California; Consulting Staff, Hollywood Presbyterian Hospital, Los Angeles, Methodist Hospital of Southern California, Los Angeles, Physicians and Surgeons Hospital, Glendale, California; and Member of the Staff, Los Angeles County Hospital, Los Angeles. Ed. 3. Cloth. Pp. 716. Price $12.50. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1956.

HYPERTENSION. A Manual for Patients with High Blood Pressure. By Irvine H. Page, A.B., M.D., Director, Research Division, Cleveland Clinic Foundation; President of the American Heart Association, Cleveland, Ohio. Ed. 2. Cloth. Pp. 109, with illustrations. Price $3.00. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

OPERATIVE TECHNIC IN SPECIALTY SURGERY. Edited by Warren H. Cole, M.D., F.A.C.S., Professor of Surgery and Head of the Department, University of Illinois College of Medicine; Chief Surgeon, Illinois Research and Educational Hospitals, Chicago. With 67 contributing authors. Ed. 2. Cloth. Pp. 967, with illustrations. Price $20.00. Appleton-Century-Crofts, 35 W. 32nd St., New York 1, 1956.

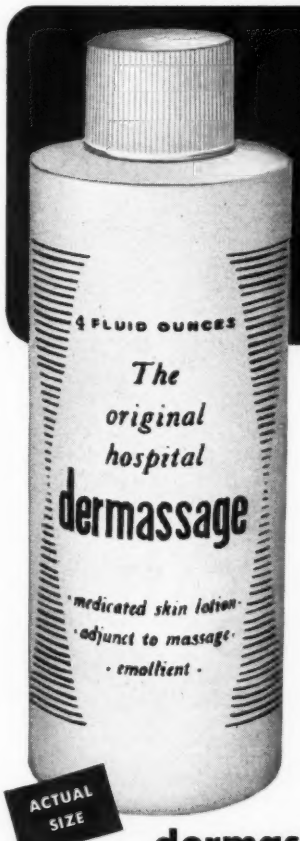
CLINICAL STUDIES IN NEUROLOGY. By Harry Lee Parker, M.S., M.D., F.R.C.P.I., Professor of Neurology, Mayo Foundation, Graduate School, University of Minnesota; Senior Consultant, Section of Neurology, Mayo Clinic, Rochester, Minnesota. Cloth. Pp. 364. Price $6.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

THE NEUROSES IN CLINICAL PRACTICE. By Henry P. Laughlin, M.D., Assistant Clinical Professor of Psychiatry, George Washington University School of Medicine; Head, Psychiatry and Neurology Division, Suburban Hospital, Bethesda, Maryland; Consultant in Psychiatry, Walter Reed Army Medical Center. Cloth. Pp. 802, with illustrations. Price $12.50. W. B. Saunders Company, West Washington Square, Philadelphia 5, 1956.

THE CERVICAL SYNDROME. By Ruth Jackson, B.A., M.D., F.A.C.S., Clinical Assistant Professor of Orthopaedic Surgery, Southwestern Medical School of the University of Texas, Dallas; Attending Orthopaedic Surgeon, Baylor University Hospital; Formerly Chief of Orthopaedic Surgery, Parkland Hospital, and Instructor in Orthopaedic Surgery, Baylor University College of Medicine, Dallas, Texas. Paper. Pp. 130, with illustrations. Price $4.75. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

BASIC PRINCIPLES OF PARLIAMENTARY LAW AND PROTOCOL. By Marguerite Grumme. Paper. Pp. 68. Price $1.00. 3830 Humphrey Street, St. Louis 16, 1955.

MODERN OPERATIVE SURGERY. Volume I. Edited by the late G. Grey Turner, LL.D., D.Ch., M.S., F.R.C.S., F.R.A.C.S., F.A.C.S, Professor of Surgery in the University of London and Director of the Department of Surgery at the British Postgraduate Medical School; Surgeon, Hammersmith Hospital; Emeritus Professor of Surgery in the University of Durham; Honorary Consulting Surgeon, Royal Victoria Infirmary, Newcastle-upon-Tyne; and Lambert Charles Rogers, V.R.D., M.Sc., M.D., F.R.C.S., F.R.C.S.E., F.R.A.C.S., F.A.C.S., Professor of Surgery, University of Wales; Director of Surgical Unit, Cardiff Royal Infirmary; Surgeon, United Cardiff Hospitals; Adviser in Surgery, Welsh Regional Hospital Board; Consultant in Neurosurgery to the Royal Navy; Member of Council and formerly Member of Court of Examiners and Vice



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MEDICAL TERMS. Their Origin and Construction. By Ffrangcon Roberts, M.A., M.D., F.F.R. Ed. 2. Paper. Pp. 88. Price $2.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1955.

ALLERGY IN CHILDHOOD. By Jerome Glaser, M.D., Assistant Professor of Pediatrics, the University of Rochester School of Medicine and Dentistry; Pediatrician-in-Chief, Genesee Hospital; Consulting Pediatrician, the Rochester General Hospital and St. Mary's Hospital, Rochester, New York. Regional Consultant, the Jewish National Home for Asthmatic Children, Denver, Colorado; Member of the Board of Regents of the American College of Allergists; Chairman of the Section on Allergy of the American Academy of Pediatrics. Cloth. Pp. 529, with illustrations. Price $12.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

OBSTETRIC PRACTICE. By Harold Speert, M.D., Associate in Obstetrics and Gynecology, Columbia University College of Physicians and Surgeons, and Assistant Attending Obstetrician and Gynecologist, The Presbyterian Hospital; and Alan F. Guttmacher, M.D., Director of the Department of Obstetrics and Gynecology, the Mount Sinai Hospital, and Clinical Professor of Obstetrics and Gynecology, Columbia University College of Physicians and Surgeons. Cloth. Pp. 478. Price $7.00. The Blakiston Division of the McGraw-Hill Book Company, 330 W. 42nd St., New York 36, 1956.

TECHNIQUES IN BLOOD GROUPING. By Ivor Dunsford, Senior Scientific Officer, Region Blood Transfusion Centre, Sheffield; Lecturer, Sheffield College of Technology; and C. Christopher Bowley, M.B., B.S., M.R.C.O.G., Director, Regional Blood Transfusion Centre, Sheffield; Hon. Lecturer to the Department of Pathology, University of Sheffield; with a preface by R. R. Race, F.R.S., Director, Medical Research Council, Blood Group Research Unit, London. Cloth. Pp. 250, with illustrations. Price $4.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1955.

CLINICAL MANAGEMENT OF RENAL FAILURE. By Maurice B. Strauss, M.D., Professor of Clinical Medicine, Boston University School of Medicine; Lecturer in Medicine, Tufts University School of Medicine; Lecturer on Medicine, Harvard Medical School; Chief, Medical Service, Boston Veterans Administration Hospital, Boston, Massachusetts; and Lawrence G. Raisz, M.D., Instructor in Medicine, Boston University School of Medicine; Physician, Medical Service, Boston Veterans Administration Hospital, Boston, Massachusetts. Paper. Pp. 114. Price $2.75. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

SUBPHRENIC ABSCESS. By H. R. S. Harley, M.S., F.R.C.S., Consultant Thoracic Surgeon to the United Cardiff Hospitals and to the Welsh Regional Hospital Board. Cloth. Pp. 216, with illustrations. Price $7.00. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1955.

THE DIAGNOSIS AND TREATMENT OF POSTURAL DEFECTS. By Winthrop Morgan Phelps, M.D., Medical Director, Children's Rehabilitation Institute for Cerebral Palsy, Baltimore; Consultant in Cerebral Palsy for the States of New York, New Jersey, Delaware, Maryland, Pennsylvania and others; Robert J. H. Kiphuth, M.P.E., Professor of Physical Education, Yale University; and Charles Weer Goff, M.D., Associate Clinical Professor of Orthopaedic Surgery and Lecturer in Anatomy, Yale University, School of Medicine; Attending Orthopedic Surgeon, Newington Home and Hospital for Crippled Children; Visiting Professor of Physical Anthropology, Hartford Seminary Foundation; Member, Society for Research and Child Development; Late Member, Posture Committee, American Academy of Orthopaedic Surgeons. Ed. 2. Cloth. Pp. 190, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

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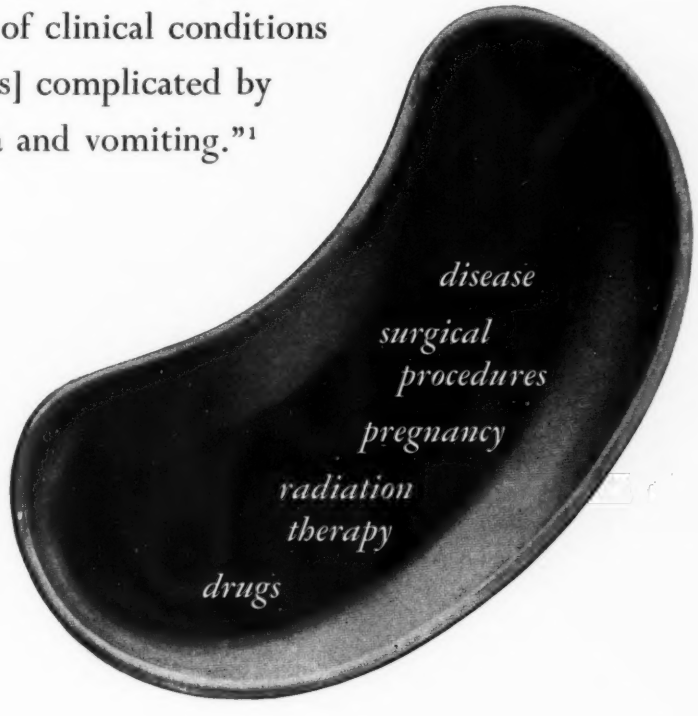

1. Moyer, J.H., et al.: Arch. Int. Med. 95:202 (Feb.) 1955.

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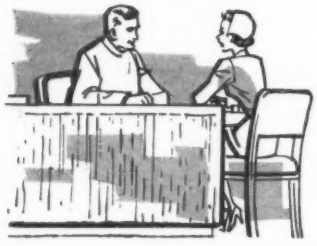

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Adams, Warren P., from St. Claire Shores, Mich., to 3313 S. E. Second St., Pompano Beach, Fla.

Aguilar, Conrad F., from Walnut Creek, Calif., to 460 Staten Ave., Oakland 10, Calif.

Ballard, William R., from 801 W. Tenth St., to 821 W. Ninth St., Amarillo, Texas

Beavers, Robert L., from 545 S. San Gabriel Ave., to 545 N. San Gabriel Ave., Azusa, Calif.

Beck, Raymond E., from 1917B Pecos St., to 1808 N. E. Eighth St., Amarillo, Texas

Blain, James L., CCO '55; Rocky Mountain Osteopathic Hospital, 4701 E. Ninth Ave., Denver 20, Colo.

Boone, Richard F., from Dallas, Texas, to Box 4424, Santa Fe, N. Mex.

Borgman, George J., from 1319 Hamilton St., to 45 S. Ninth St., Allentown, Pa.

Calitri, Carmine J., COPS '54; 6225 Clarkson Ave., Bell, Calif.

Chadney, J. Douglas, from 2621 Wilshire Blvd., to 3163 Los Feliz Blvd., Los Angeles 39, Calif.

Comstock, Jack D., from 20041 W. Eight Mile Road, to 23800 Grand River Ave., Detroit 19, Mich.

Crane, Lester L., from 2381 Cottage Way, to 941 Fulton Ave., Sacramento 21, Calif.

De Coro, Camillo T., COPS '54; 720 Norbert Drive, San Bernardino, Calif.

De Prisco, John, from 2000 S. 11th St., to 2745 Moore St., Philadelphia 45, Pa.

Disbrow, Elliott R., Jr., from 1299 W. King St., to 538 W. Market St., York, Pa.

Dubin, H. Mayer, from Downey, Calif., to 8300 Telegraph Road, Rivera, Calif.

Eisenman, Jack Isaac, COPS '54; 1207 Horn Ave., Los Angeles 46, Calif.

Elliot, Raymond A., from Forsyth, Mont., to 928 N. Canal St., Carlsbad, N. Mex.

Elston, William L., from Cortland, Ohio, to Grandview Hospital, 405 Grand Ave., Dayton 5, Ohio

Eske, Louis H., Jr., from Groton, S. Dak., to 1928 S. Smithville Road, Dayton 10, Ohio

Farnham, G. M., from Hazel Park, Mich., to 113 S. Main St., Nashville, Mich.

Feinman, Leonard C., from 1048 Temple St., to 3358 Rowena Ave., Los Angeles 27, Calif.

Feldman, Raymond K., from 11903 Santa Monica Blvd., to 1222 S. Spaulding Ave., Los Angeles 19, Calif.

Friedman, Benjamin T., COPS '54; 758 N. Hudson Ave., Los Angeles 38, Calif.

Frost, Jack, from 905-07 Heartwell Bldg., to 2272 Pacific Ave., Long Beach 6, Calif.

Gienger, Ernest S., from 744 E. Charter Way, to 412 W. Harding Way, Stockton 4, Calif.

Greenholz, Jerome, from 500 Oriental Blvd., to 52 Clark St., Brooklyn 2, N. Y.

Greenway, John A., from Chicago, Ill., to 14229 Woodlawn Ave., Dolton, Ill.

Gustafson, Robert W., from 337 E. Coast St., to 3020 E. 14th St., Des Moines 16, Iowa

Haduck, Walter E., from Detroit, Mich., to 2878 Orchard Lake Road, Keego Harbor, Mich.

Hartwell, Elbert E., from Emmett, Idaho, to 531 S. Fourth St., Las Vegas, Nev.

Hensley, Henry, from Tyler, Texas, to Box 266, Franklin, Texas

Herbst, Henry B., from 41 E. Walnut Lane, to 8301 Stenton Ave., Wyndmoor, Philadelphia 18, Pa.

Hitch, Samuel H., from 702 Lubbock Natl. Bldg., to 2903 Avenue Q, Lubbock, Texas

Horne, Carroll V., from Leslie, Mich., to 819 Leonard St., N. W., Grand Rapids 4, Mich.

Houghton, Raymond S., from South Paris, Maine, to 314 N. Dawson St., Thomasville, Ga.

Husted, Russell M., from 907 Heartwell Bldg., to 2272 Pacific Ave., Long Beach 6, Calif.

Jaffe, Aaron H., from Los Angeles, Calif., to 10128 E. Rosecrans Ave., Bellflower, Calif.

Jenkins, Constance Idtse, from Franklin, Texas, to Granbury General Hospital, Granbury, Texas.

Jenkins, William R., from Franklin, Texas, to Granbury General Hospital, Granbury, Texas

Kaplus, Albert, from 3600 Fieldston Road, to 2685 Grand Concourse, Bronx 68, N. Y.

Kellman, Milton, from Allen Park, Mich., to 3577 Fort St., Lincoln Park 25, Mich.

Kerr, Harry N., from Miami, Fla., to 235 Catalonia Ave., Coral Gables 34, Fla.

Klucka, Thomas J., from Detroit, Mich., to 12951 Oakdale, Wyandotte, Mich.

Knight, Emery R., Jr., KC '55; Community Hospital, Inc., 1405 Holland Ave., Houston 15, Texas
Kovacs, Stephen J., Jr., PCO '55; Rocky Mountain Osteopathic Hospital, 4701 E. Ninth Ave., Denver 20, Colo.
Landau, Robert N., from Sacramento, Calif., to 400 N. Glenoaks Blvd., Burbank, Calif.
Lash, John W., from Santa Ana, Calif., to 1400 N. Mount Vernon, San Bernardino, Calif.
Lyons, James T., from Crosby, Texas, to 7112 Lyons Ave., Houston 20, Texas
Mann, Earle H., from 801 W. Tenth St., to 821 W. Ninth St., Amarillo, Texas
Mann, Maurice D., from 801 W. Tenth St., to 821 W. Ninth St., Amarillo, Texas
Mann, Raymond E., from 801 W. Tenth St., to 821 W. Ninth St., Amarillo, Texas
Mayer, Fergus, from 1040 66th St., to Wilden Osteopathic Hospital, E. 14th & Capitol Aves., Des Moines 16, Iowa
Mines, Julian L., from 8006 Sunset Blvd., to 1449 N. Gardner St., Los Angeles 46, Calif.
Mitchell, Carson A., from Delano, Calif., to Box 1046, Paradise, Calif.
Molders, Robert E., from Freeland, Mich., to Saginaw Osteopathic Hospital, 515 N. Michigan Ave., Saginaw, Mich.
Mohammed, Harry H., from Anderson, Ind., to 1202 E. Michigan Ave., Jackson, Mich.
Murray, Robert W., from 4621 52nd St., to 18903 W. Seven Mile Road, Detroit 19, Mich.
Parsons, H. F., from 2848 Scott St., to 2452 Van Ness Ave., San Francisco 9, Calif.
Pedersen, Arthur D., from Rolling Hills, Calif., to 1613 Elena Ave., Redondo Beach, Calif.
Pike, Claire E., from 19 Pine St., to 2272 Pacific Ave., Long Beach 6, Calif.
Plansoen, Cornelius L., from Cambridge Springs, Pa., to Main St., Mount Jewett, Pa.
Purtzer, Horace C., from 319 E. Dunlap, to 38 W. Dunlap, Phoenix 52, Ariz.
Quick, John B., from North Hollywood, Calif., to 7424 Haskell Ave., Van Nuys, Calif.
Rocine, Bertha C., from 3800 S. W. Baird St., to 2265 N. W. Kearney St., Portland 10, Ore.
Rudner, Murray A., from 2630 Corunna Road, to 3502 Corunna Road, Flint 3, Mich.
Russell, John F., from Clint, Texas, to Box 847, Tularosa, N. Mex.
Russell, Ray M., from Beverly Hills, Calif., to 640 W. Avenue J, Lancaster, Calif.
Rutherford, John Lee, DMS '55; Oklahoma Osteopathic Hospital, 744 W. Ninth St., Tulsa 5, Okla.
Scheurer, George H., from Williamsport, Pa., to Kirksville Osteopathic Hospital, 800 W. Jefferson St., Kirksville, Mo.
Schultz, Lavertia L., from 183 Third Ave., to 122 Second Ave., Chula Vista, Calif.
Schwartz, Walter W., from 1625 Grange Ave., to 170 W. Cheltenham Ave., Philadelphia 20, Pa.
Shild, Tobias, from Philadelphia, Pa., to 289 Richards Ave., Lansdowne, Pa.
Silpe, Norbert L., PCO '55; Rocky Mountain Osteopathic Hospital, 4701 E. Ninth Ave., Denver 20, Colo.
Sims, Bruce F., from Fresno, Calif., to Oakhurst, Calif.
Slocum, Howard I., from Battell Block, to Box 368, Middlebury, Vt.
Smith, Leonard, from Levittown, Pa., to Box 58, Langhorne, Pa.
Stirling, Robert K., CCO '55; Riverside Osteopathic Hospital, 165 George St., Trenton, Mich.
Stowell, I. T., from San Antonio, Texas, to 215 S. Euclid Ave., Pasadena 5, Calif.
Strakis, Marie H., CCO '55; McLaughlin Osteopathic Hospital, 619 Townsend St., Lansing 15, Mich.
Strefling, Michael R., Jr., CCO '55; 1821 Sanford St., Muskegon, Mich.
Stuart, Herbert R., from Tulsa, Okla., to 9112 Asbury Park, Detroit 28, Mich.
Stucker, John P., from Alexandria, Ohio, to 65 W. Main St., New Albany, Ohio
Tait, Herbert A., from 427 N. Main St., to 509 N. Main St., Adrian, Mich.
Tedford, John A., from Burbank, Calif., to 4362 Melrose Ave., Los Angeles 29, Calif.
Thomas, Walter R., from San Gabriel, Calif., to 600 Carroll Way, Pasadena 10, Calif.
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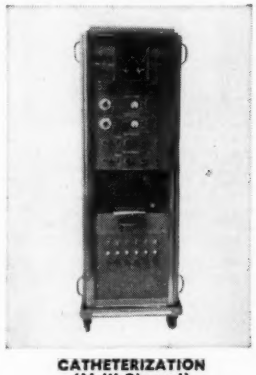

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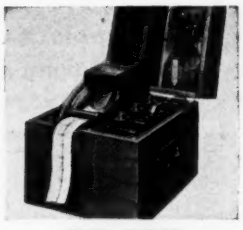

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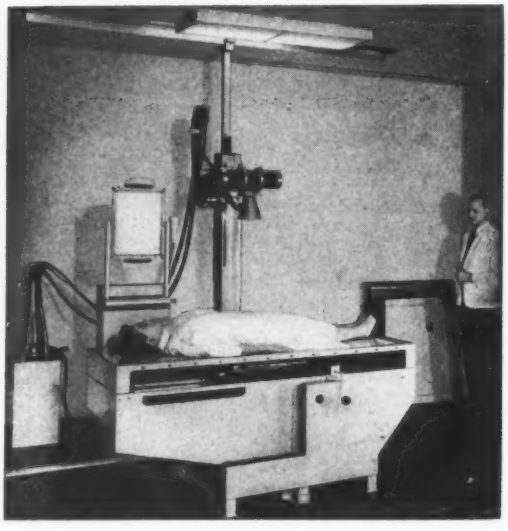

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Weinberg, Seymour, COPS 54; 730 Lower Azusa Road, El Monte, Calif.

White, Robert E., from Nashville, Mich., to 71 S. 20th St., Battle Creek, Mich.

Willcutt, Eugene C., from Houston, Texas, to 5412 Olson Place, El Paso, Texas

Wilson, Cleo David, from Shidler, Okla., to Box 157, Tuttle, Okla.

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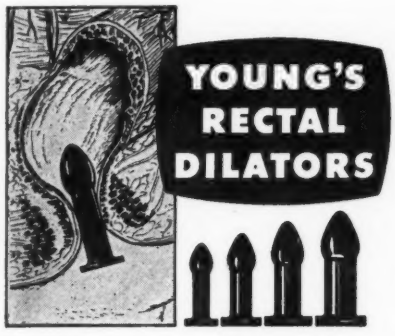

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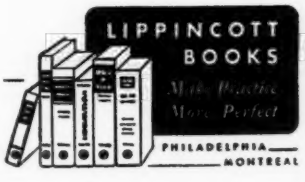

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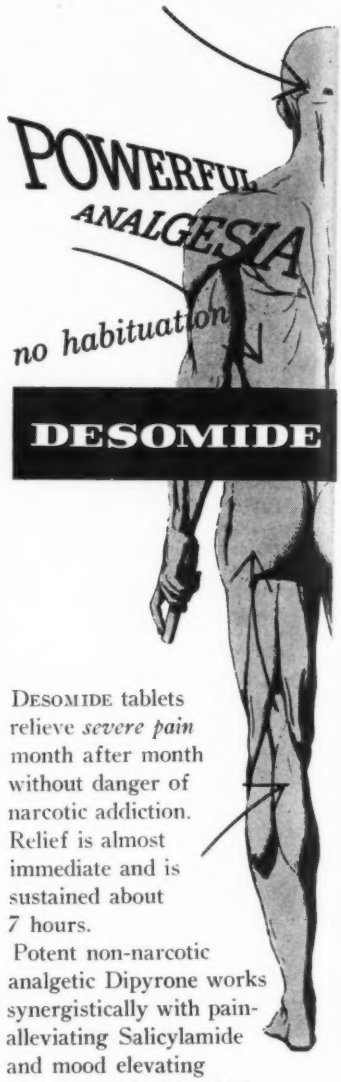

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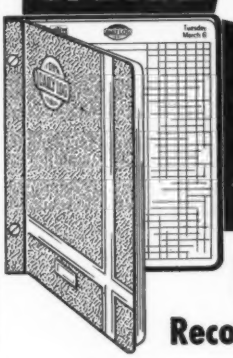

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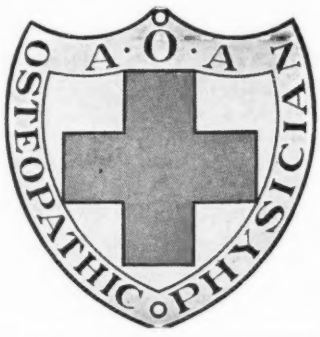

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1. *The Dispensatory of the United States of America*, 25th ed., 1955, p. 822.
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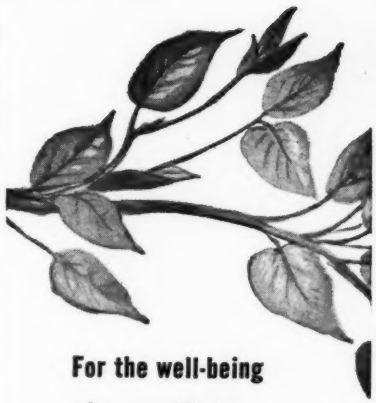

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Ideal method—Studies show diaphragm-jelly technique gives the greatest degree of protection.[1] It is preferred for women of high parity who want large families—but only *when* they want them. Urban population groups using diaphragm and jelly as recommended have an unplanned pregnancy only "once in ten to 15 years."[1]

Comfort important—With peace of mind goes comfort when the physician prescribes the RAMSES® Diaphragm. Its cushioned rim guards against irritation; flexibility in all planes permits easy movement. RAMSES Jelly,* a "ten-hour jelly," used with the RAMSES Diaphragm, immobilizes sperm, is well tolerated, and stays effective for a full ten hours.

Neat TUK-A-WAY® *Kit*—Patients are confident of receiving sound contraceptive advice when they learn that *for thirty years* physicians have relied on RAMSES Diaphragm and Jelly to help *plan* big families. RAMSES TUK-A-WAY Kit, #701 (diaphragm, introducer and jelly), RAMSES Diaphragms 50-95 millimeters in size, RAMSES Jelly in 3 and 5 oz. tubes.

1. Tietze, C., in Dickinson, R. L.: Techniques of Conception Control, ed. 3, Baltimore, Williams & Wilkins Co., 1950, pp. 55-57.

*Active agent, dodecaethyleneglycol monolaurate 5%, in a base of long-lasting barrier effectiveness.

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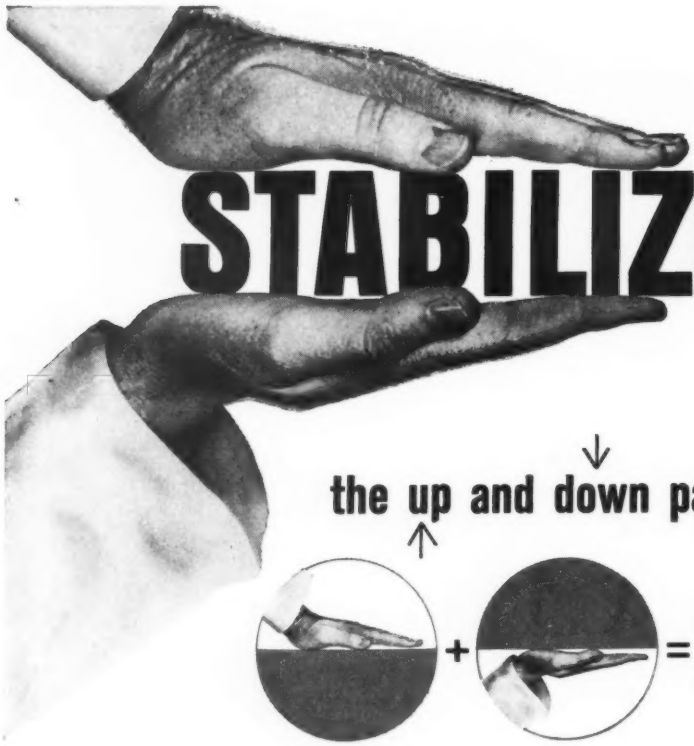

STABILIZE

the up and down patient

Serpasil
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Ritalin
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Serpatilin
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To induce emotional equilibrium in those who swing from anxiety to depression, Serpatilin combines the relaxing, tranquilizing action of Serpasil with the mild mood-lifting effect of the new cortical stimulant, Ritalin. In recent months, numerous clinical studies have indicated the value of combining these agents for the treatment of various disorders marked by tension, nervousness, anxiety, apathy, irritability and depression. Arnoff,[1] in a study of 51 patients, found the combination of definite value in a variety of complaints, noting no effect on blood pressure or heart rate. Lazarte and Petersen[2] also found Serpatilin effective in counteracting the side effects of reserpine and chlorpromazine. They reported: "The stimulating effect of Ritalin seemed complementary to the action of reserpine . . . in that it brought forth a better quality of increased psychomotor activity."

1. Arnoff, B.: Personal communication. 2. Lazarte, J. A., and Petersen, M.C.: Personal communication.

Serpatilin Tablets, 0.1 mg./10 mg., each containing 0.1 mg. Serpasil® (reserpine CIBA) and 10 mg. Ritalin® hydrochloride (methyl-phenidylacetate hydrochloride CIBA).

Dosage: 1 tablet b.i.d. or t.i.d., adjusted to the individual.

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